INTERIM REPORT No. 1

GEORGIAN BAY CANAL COMMISSION
WHEAT PRICES

AND A COMPARATIVE STUDY OF UNITED STATES AND CANADIAN MARKETS

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PRINTED BY AUTHORITY OF PARLIAMENT

OTTAWA
J. DE LABROQUERIE TACHÉ
PRINTER TO THE KING'S MOST EXCELLENT MAJESTY
[No. 141—1918.]

INTRODUCTION.

By the order in council, under which the Georgian Bay Canal Commission was appointed, provision was made for a careful and thorough inquiry into many questions bearing upon the problem of the proposed construction of a deep inland waterway, and included in the questions specifically mentioned were "the percentage of Canadian traffic handled through United States ports, and causes for this diversion," "the requirements to move the grain crop in the future to open market," and the general question of "markets".

In my Interim Report of 1916 the conditions were examined under which diversions of Canadian traffic to United States routes had been taking place. From the analysis there made (pp. 62-79) it is evident that the conditions governing ocean transportation have been fundamental causes of the diversion that has regularly occurred. The probable influence of other causes was pointed out, but the facts necessary to an understanding of the operation of these other causes were not fully set forth. To supplement the former report in important respects it is proposed to investigate certain further facts relating to the marketing of wheat and flour and the making of prices, and particularly by way of a comparative study of United States and Canadian market conditions. This has become all the more essential because free trade in wheat and flour has been legally established since the interim report was submitted and possible new causes of diversion have thus to be reckoned with. Although free reciprocal trading in wheat and flour between Canada and the United States was established on April 16, 1917, the new system, owing to special conditions, has not been practically operative and its normal effects cannot be judged by any developments that have so far occurred. The elements of the problem can, however, be examined and appraised.

This report will assemble and present facts rather than reason to conclusions. Particular attention will be given to the conditions affecting price. From the standpoint of this inquiry the important effect of the change in trading relations with the United States would be an effect produced on the routing of Canadian wheat and price is one of the most powerful of all diverting influences. As Canada is the producer of a very large surplus of wheat above home requirements, the ruling price in Canada must be such that wheat can be exported. In any season there may be days or even weeks with very limited quantities offering, when the price rises above the export basis; but for the greater part of every year and whenever any considerable quantities come forward, wheat in Canada goes at a price at which it will be purchased by the principal consuming markets, which in the main are the markets of western Europe. If the United States would pay a better price than this export basis our wheat would undoubtedly go into the United States as often and as long as this condition prevailed.

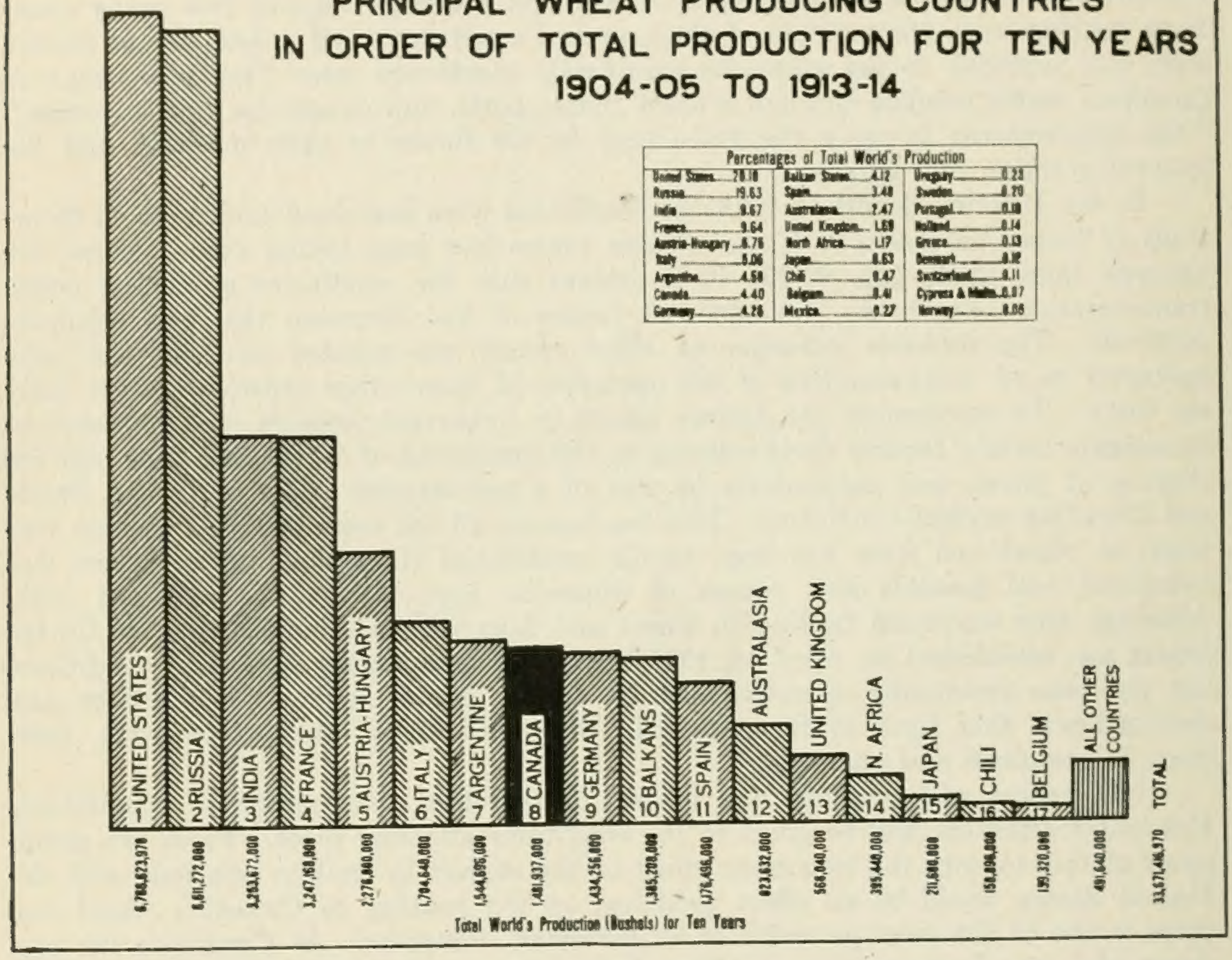
Even if no better price were offered, wheat might move to the United States in considerable volume because of the relative financial and other facilities for handling it or the enterprise and organization of dealers. It might be consumed in the United States, releasing more of the domestic crop for export; it might be re-exported either in straight grades as received or mixed with local wheat; or it might be milled in the United States and exported as flour. The effects on Canada would be different according to each different use to which the wheat was put, and it would make an important difference at what points the wheat crossed the border. The fundamental

facts underlying each of these, and many other, aspects of a very complex problem are of practical interest and must be understood if intelligent preparation is to be made for the developments that will tend to occur.

DIAGRAM NO. 1.

PRINCIPAL WHEAT PRODUCING COUNTRIES
IN ORDER OF TOTAL PRODUCTION FOR TEN YEARS
1904-05 TO 1913-14

Percentages of Total World's Production		
United States 28.18	Balkan States 4.12	Uruguay 0.23
Russia 19.63	Spain 3.48	Sweden 0.20
India 9.67	Australasia 2.47	Portugal 0.18
France 9.64	United Kingdom 1.69	Holland 0.14
Austria-Hungary 8.76	North Africa 1.17	Greece 0.13
Italy 5.06	Japan 0.63	Denmark 0.12
Argentine 4.58	Chili 0.47	Switzerland 0.11
Canada 4.40	Belgium 0.41	Cyprus & Malta 0.07
Germany 4.26	Mexico 0.27	Norway 0.06



GENERAL FACTS.

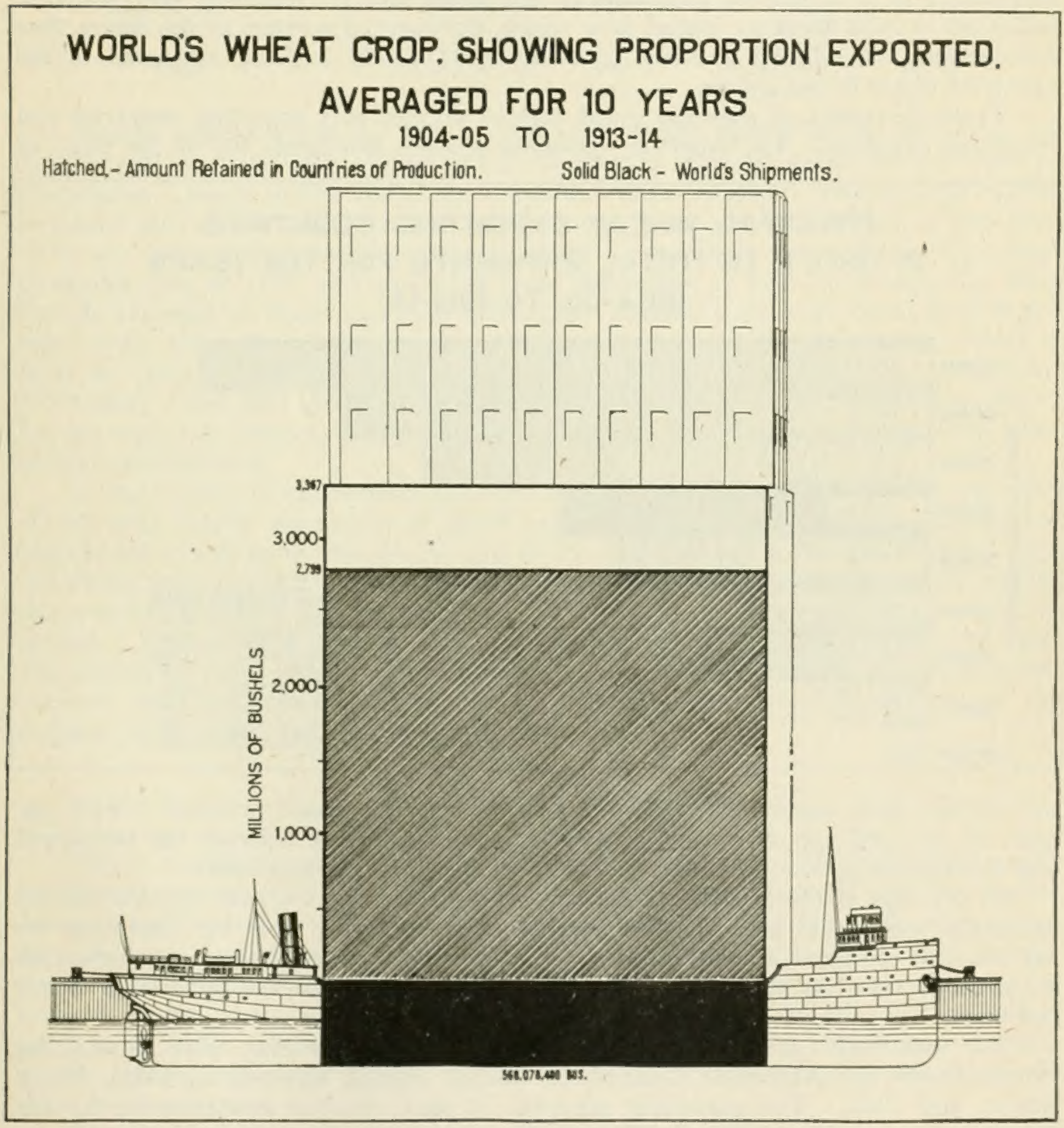
A few general facts may be sketched by way of background to the particular inquiries to be undertaken here.

Quantities and geographical distribution of wheat production.—During the ten cereal years before the war, from August 1, 1904, to July 31, 1914, statistics record an aggregate production of wheat in the world of 33,671,416,970 bushels, or an average per year of one-tenth of that amount. (Broomhall's statistics are taken as the basis of calculations in this report for all countries except the United States and Canada, for which the official Government statistics are adopted.) Of this total Europe produced over 54 per cent, and if the Asiatic provinces of Russia be included with Europe the percentage is 56·01. North America produced 24·77 per cent; South America 5·28 per cent; Australia 2·57 per cent; Asia (British India and Japan) 10·3 per cent; Africa (Algeria and Tunis), the balance of 1·17 per cent. Not less than 92·25 per cent was grown in the Northern Hemisphere, and 7·75 per cent in the Southern Hemisphere.

Wheat is harvested somewhere every month in the year, but perhaps about 80 per cent of the world's supply is harvested in one-third of the year, June 15 to October 15. A storage problem of considerable magnitude, therefore, must necessarily exist.

In order of production during this period the principal countries stand as in diagram 1, (see v. also Appendix, pp. 83 and 84). The United States is first, followed closely by Russia. India, France, Austria-Hungary, Italy, and the Argentine stand next in order and all produced more wheat than Canada, which is eighth on the list. Germany produced almost as much as Canada; and the Balkan States, 93·4 per cent of Canada's production. Spain produced 79·03 per cent, and Australasia 54·49 per cent of Canada's production.

DIAGRAM NO. 2.



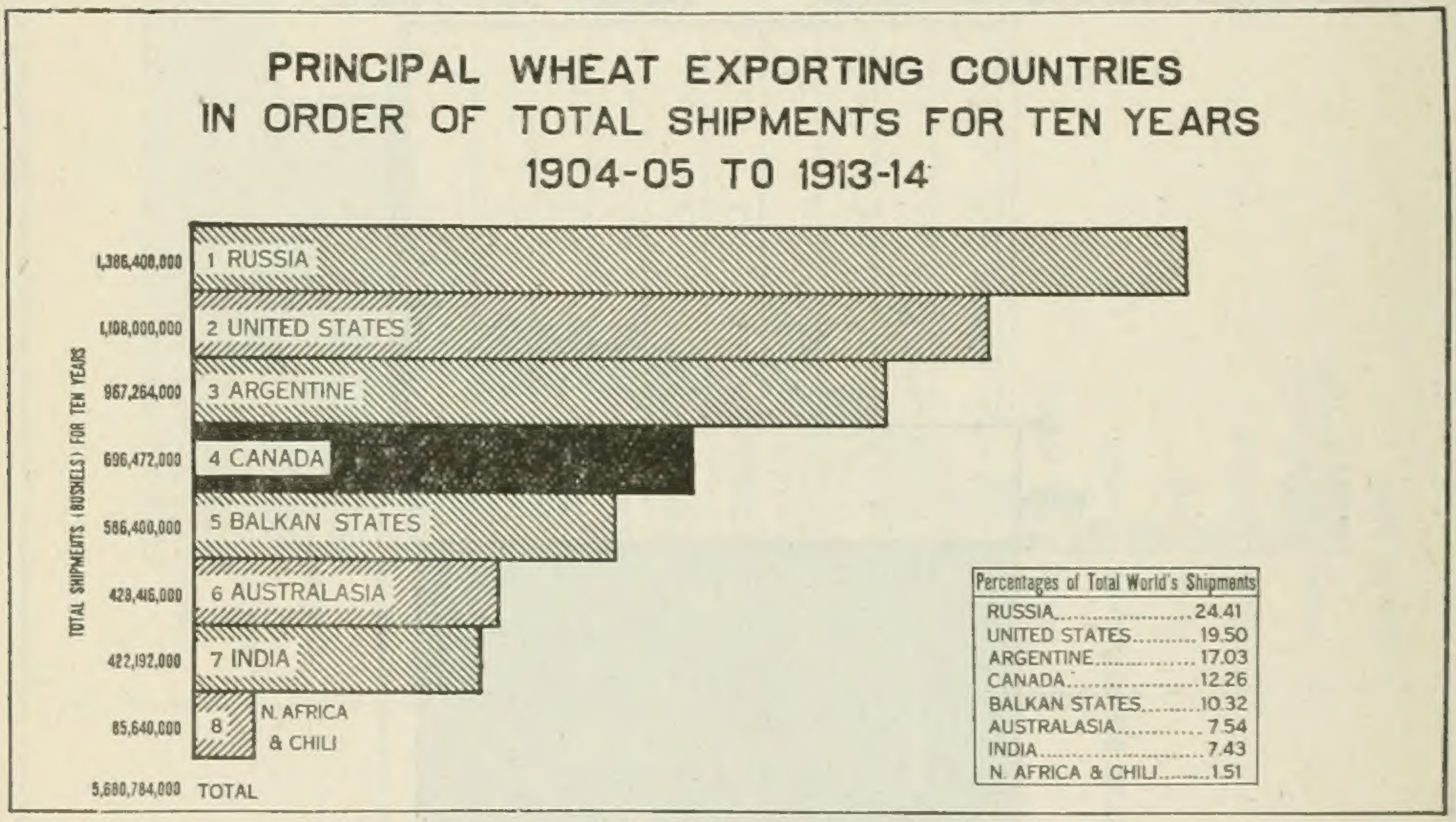
Canada's production, however, increased during this period at a greater rate than that of any other principal country. On the showing for the last three years, 1911-12 to 1913-14, Canada stands sixth on the list, having passed Italy and the Argen-

tine. Canada's great crop of 1915, 393,542,600 bushels, was larger than any crop of any country during the above ten years, with the exception of the United States and Russia.

Distribution in relation to consumption demand.—To what extent during this period was wheat produced where it was needed for consumption? Five bushels of every six produced in the world were consumed in the countries in which they were grown, while one-sixth of the total was moved from countries with surpluses to countries with deficiencies.

In diagram 2 the average yearly world production of wheat, 3,367,141,697 bushels, would just fill the elevator shown, while the international trade in wheat and floor, the "world's shipments," 568,078,400 bushels ("World's shipments" are returns of export wheat passing by sea and do not include exports that reach countries of final destination by land, but the quantities in this latter case are relatively very small) is indicated in solid black as loaded in a vessel, the hatched portion of the figure thus representing the relative quantity of wheat 2,799,063,297 bushels, consumed in the countries where it was grown.

From this point of view the world may be divided into exporting countries and importing countries. The exporting countries produce two-thirds (66·61 per cent) of



the world's total supply, 2,242,137,697 bushels, and consumed one-half (49·72 per cent) of the total supply, 1,674,059,297 bushels, the difference between the two-thirds and one-half being the one-sixth that entered into international trade.

In the case of the exporting countries the figures given for consumption are the quantities retained at home and are arrived at by deducting from the total crop the net amounts exported as wheat and flour; while the consumption of the importing countries is taken as the sum of the domestic crops and the net imports of wheat and flour.

The exporting countries, in the order of quantities exported, were Russia, the United States, the Argentine, Canada, the Balkan States, Australasia, India, North Africa, and Chili. The quantities exported by each of these countries in the ten years are shown in diagram 3. It will be noted that these countries do not, as exporters, stand in the same order to each other as they did in diagram 1, which shows them as producers. Russia, for example, exported more than the United States, although it produced less. India, the third largest producer in the world,

exported less than Australasia, the twelfth in the list of producers. The Argentine, Canada, the Balkan States and Australasia preserve the same order relative to each other (see tables 3, 4 and 5, pp. 85, 86 and 87).

In the following table the exporting countries are set forth with the quantities produced and the percentages of the total world's crop, and also with quantities exported and their percentage of the world's shipments:—

	Production. (bushels)	(per cent)	Exports. (bushels)	(per cent)
United States..	6,766,623,970	20·10	1,108,000,000	19·50
Russia..	6,611,272,000	19·63	1,386,400,000	24·41
India..	3,253,672,000	9·67	422,192,000	7·43
Argentina..	1,544,696,000	4·58	967,264,000	17·03
Canada..	1,481,937,000	4·40	696,472,000	12·26
Balkan States..	1,385,208,000	4·12	586,400,000	10·32
Australasia.	823,632,000	2·47	428,316,000	7·54
Nor. Africa and Chili.	554,336,000	1·64	85,640,000	1·51
Total..	22,421,376,970	66·61	5,680,784,000	100·00

Canada produced 4·40 per cent of the total world's supply in the ten years, but contributed 12·26 per cent of the world's shipments. Comparatively unimportant as a producer, Canada proved distinctly important as an exporter. Her exports rapidly increased during the period and in the last three years she contributed no less than 18·35 per cent of the total shipments. Taking for comparison the year of the great Canadian crop of 1915, and reckoning from September 1, 1915, to August 31, 1916, Canada exported in wheat and flour 289,136,040 bushels, a quantity equal to 50·9 per cent of the average world's shipments for the ten years under review; and equal to 48·47 per cent of the actual world's shipments in the above twelve months, of 596,552,000 bushels which was about 10 per cent above the average. The Central Empires of Europe could not import, in that year, but other countries had taken more than their normal requirements.

In the matter of production the Southern Hemisphere, with only 7·75 per cent of the total, might not appear of great consequence, but the Southern Hemisphere contributed a little more than 25 per cent of the total shipments and therefore is a very important factor indeed in the export trade. Only about 66·5 per cent of the world's shipments is supplied by districts harvesting between June 15 and October 15, as against a production in these districts of about 80 per cent of the world's total crop. The elements of the storage problem in respect to the quantities entering into international trade exist, therefore, in somewhat different proportions from those in the problem presented by production looked at as a whole.

QUANTITY AND PRICE.

Before considering the particular problem of Canadian wheat prices as they might be affected by changes in the conditions of trade between Canada and the United States, it will be well to understand general conditions affecting price. To what extent does the law of supply and demand determine the price of wheat and other grains; and, if there is any direct relationship between the quality of grain available and the price at which it can be sold, is this a merely local relationship affecting individual markets, or is it a general worldwide relationship? A case of a cereal having chiefly a local market and another case of a cereal having an international market may be taken for examination.

The United States corn crop is the greatest cereal crop produced in any country in the world. In the ten years 1904-13 it amounted, on the average, to 2,712,569,800 bushels per year, a quantity equal to four-fifths of the entire world's average wheat crop. Only 2·19 per cent of the corn grown in the United States in this period was

exported and in the latter half of the period only 1·5 per cent. There was thus an immense production and an immense consumption within a single country, the surplus for export being hardly great enough to exercise any important effects. Corn in the United States may therefore be taken as an excellent example of a commodity which has a local market, and yet presents magnitude in quantity and broad distribution both in production and consumption, with a certain simplicity due to the fact that there is only one crop during the twelve months and little complication from either exports or imports. What relationship is there between the quantity and the price of corn in the United States?

As an example of an essentially international commodity, produced in almost every part of the world, maturing somewhere in every month of the year, and exported or imported in large quantities, wheat may be taken. Is there any direct relationship between the total quantity of wheat produced in the world and the prevailing price for wheat?

If the facts of quantity and price in respect both to corn in the United States and wheat throughout the world are brought together graphically some light may be thrown on such relationship as may in reality exist.

Prices should be studied comparatively The purchasing power of money varies from time to time. Influenced by a general increase in price the market quotations on a particular commodity may stand at a higher figure in one year than in another, but if the price of that particular commodity has not increased in the same percentage as has the average price of all commodities in general use, there has in reality been a decrease, for the seller of that particular commodity can purchase less with the proceeds than he could in former years. Various statistical authorities compute average prices and publish what are called "index numbers" of general prices. The course of these index numbers should be examined in connection with the course of prices of particular articles.

In diagram 4, which covers the ten crop years 1904-5 to 1913-14, there are presented three sets of facts relating to corn in the United States. Fig. 1 gives the total crop produced in each year, the scale running downward, that is, the crop is made to overhang the price line. The prices represented in fig. 2 are the monthly high and low prices of contract corn on the Chicago Board of Trade. The Chicago prices have been selected because in the volume of trading and also in the quantities of grain actually delivered, Chicago is the largest and most important market for corn in the United States. Moreover, appparently no wide differences appear in the prices quoted on the different markets at the same time. The solid black line intersecting the price variations in each year is the average of the high and low monthly quotations, and may be accepted roughly as the average price, or what might be called the par price line for the year. It is not strictly the average price to arrive at which it would be necessary to take into account not only every variation in price but also the quantities of grain sold at every price. In fig. 3 is given the course of Bradstreet's index numbers of general prices. The scales adopted for the different figures in this diagram and similarly in diagrams 5 and 6 (pp. 19 and 24) are so adjusted that equal variations represent equal percentages of change in each, taking the first year as the basis so that the appearance to the eye will convey a correct impression.

In this diagram a general correspondence between the lines of prices (fig. 2) and of quantities (fig. 1) clearly appears. During the first three years the tendency of prices was downward corresponding with the increase in quantities produced. With decreased production prices became high in 1907-8 and 1908-9, declining again with larger crops until 1911-12, when there was a sharp rise in prices with a small crop, and the fluctuations in 1912-13 and 1913-14 very closely coincide.

In only two years out of the ten was there even an apparent departure from a direct relationship between quantity and price. In 1906-7 the average price was slightly higher than in 1905-6 although the crop was larger; but this is only an

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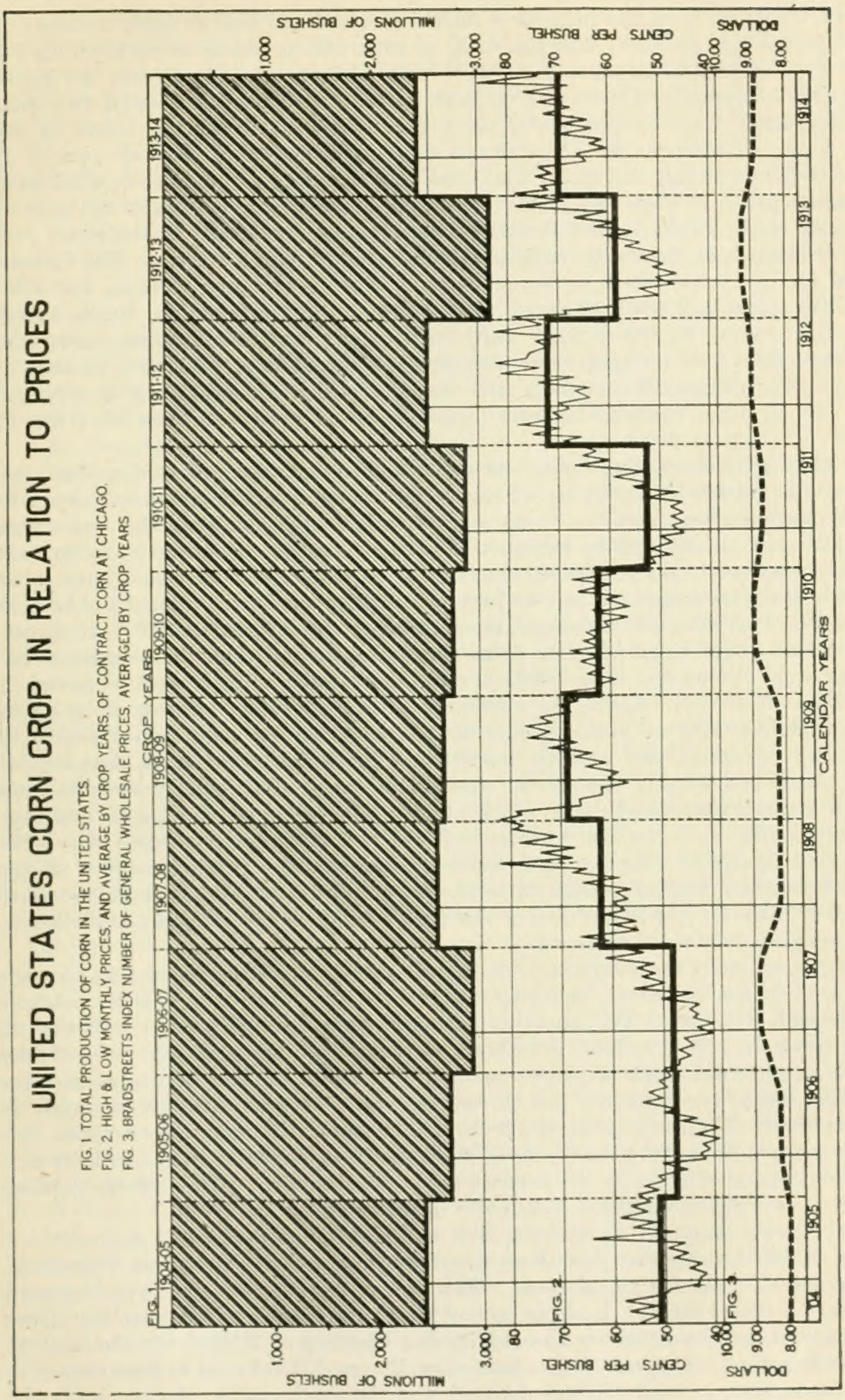


apparent departure from the rule, for a comparison with the line of index numbers of general prices (fig. 3) shows that the value of corn was in reality much lower in the former than in the latter year. In 1908-9, with a somewhat larger crop, the prices were higher, nominally and in reality, than in 1907-8. This is a case of two comparatively small crops in succession, the higher average prices being found in the second year. If reserve stocks had shown signs of depletion in the first year or if apprehension of shortage had added a keenness to demand, this would not be unnatural. The highest prices in these two years were found in the closing months of the year of the shorter crop. Prices in 1908-9 were proportionately lower than in the latter part of 1907-8 but did not react sufficiently to establish a lower year's average. The demand for feed for live stock, which is the chief use of corn, is irregular, because the number of live stock, and particularly of those being finished for market, varies widely from year to year. In 1908-9 there were inspected in the United States, under the Meat Inspection Act, 1,698,000 more slaughtered animals than in 1907-8, so that in relation to the demand the supplies may have justified a somewhat higher range of prices. In all other years prices were higher or lower when quantities were less or greater.

In the highly complex material and psychological conditions of modern business, it is not to be expected that the law of supply and demand would operate on price with absolute mathematical accuracy. As represented in the diagram the percentage changes in price do not strictly correspond to the percentage changes in quantity; but before a judgment could be reached upon this point other factors would have to be taken into the reckoning, such as that just mentioned, namely, the numbers of animal consumers in each year. For example, the percentage rise in price in 1907-8, if adjustment is made to the value of money, was very much greater than the percentage decrease in crop; but no less than 3,000,000 more slaughtered animals were inspected in 1907-8 than in 1906-7. Again, the apparently disproportionate increase in price in 1911-12 coincided with an increase, over the previous year, of more than 6,000,000 in the number of slaughtered animals inspected. The finishing of these animals for market would undoubtedly enlarge the demand for corn. Particularly when the use to which a commodity can be put, or the number of possible users, expands and contracts irregularly, as is the case with animal feed to a much greater extent than with human food, figures of quantity alone are not sufficient for a just comparison of one year with another. Making proper allowances and adjustments, the general course of corn prices in the United States during this period maintained a very close parallelism to the changing quantities produced.

Examining, now, the monthly price line in detail, it will be noted that in each year a drop in prices occurs, reaching its lowest point, except in 1909-10, between December and February. The recurring curves of these declines present a feature of marked regularity. In December corn begins to be marked freely and the price breaks as the quantities marketed become greater than the current consumption requirements; the visible supply accumulates; and prices rise again only as this visible supply is again absorbed. Within the general effects of total quantities upon the par price line for the year, are the particular effects of the quantities immediately available at any particular time in relation to the current needs of consumers. This affords another illustration of a direct relationship between quantity and price.

If the price line (fig. 2) and the line of index numbers (fig. 3) be examined together, it will be observed that these two lines are farther apart after September, 1907, than during the first three years. This means that the price of corn increased relatively to general prices. Looking now at quantities (fig. 1), it is seen that there was no general sustained increase in production. The crop of 1913-14 was the smallest of the whole period. Apparently the production of corn did not tend to keep pace with general production, or with effective demand, and the result was a relative rise in the price of corn. This, again, is a relationship between quantity and price.

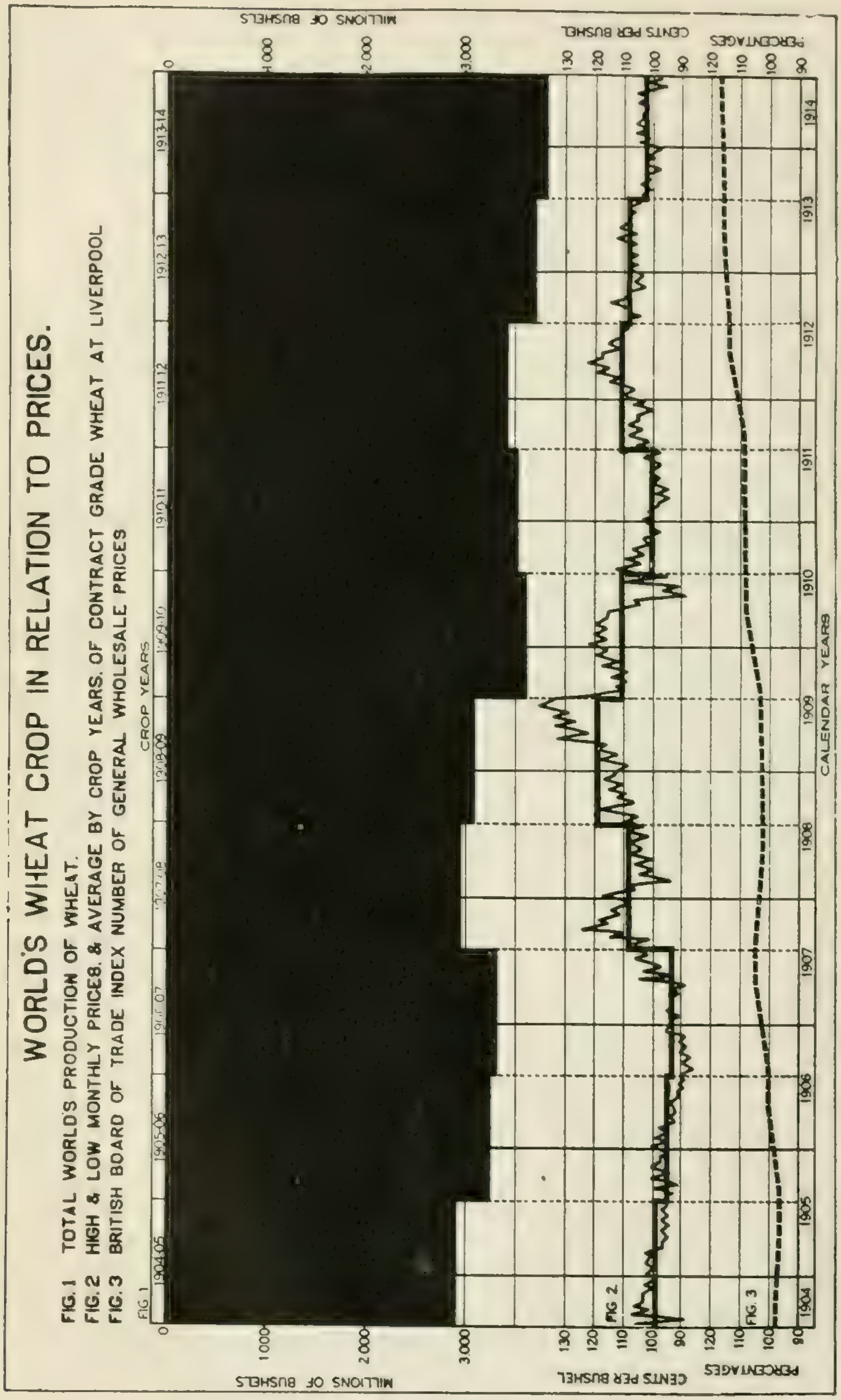
It is evident from the above examination of the facts of quantity and price, with some modification derived from facts of the fluctuation number of consumers, that the law of supply and demand operates with surprising accuracy on the price of corn under the comparatively simple conditions found in the United States. What, now, is the case in the complicated conditions and international distribution of the trade in wheat, the great staple human foodstuff? We may assume that, economic conditions remaining the same, the consumption of wheat would tend to increase slightly but steadily year by year as the population of the world grows.

In diagram 5 there is given the total world's production of wheat in each of the years 1904-5 to 1913-14 (fig. 1); the high and low monthly prices of contract grade wheat at Liverpool and the yearly average of these quotations (fig. 2); and the British Board of Trade index numbers of general wholesale prices (fig. 3). The prices of contract grade wheat at Liverpool are selected because these prices are, more nearly than any other, representative, if not really basic, world prices for wheat. The index numbers of the British Board of Trade are taken as the official compilations of general prices in the country in which the wheat quotations appear.

An examination of this diagram reveals a correspondence between the lines of price and of quantity quite as striking as that in the diagram dealing with corn in the United States. For the first four years of the period, and also for the last four years, with some adjustment to the changing value of money, even the percentage changes in the two lines are in some cases approximately the same. In 1908-9, although the world's crop was larger than in 1907-8, the price was higher; and in 1910-11, although the world's crop was somewhat smaller than in 1909-10, the price was lower. These are the only two apparent departures from rule. In 1907-8 and 1908-9 there were two comparatively small crops in succession, with a higher range of prices in the second year; and in 1909-10 and 1910-11 there were two successive crops, each of which was larger than any world's crop previous to 1909, with lower prices in the second year. In the former case, with limited supplies in sight, prices tended steadily upward from early in 1908 until July, 1909, when the new bumper crop in the northern hemisphere was assured. With superabundant supplies in sight during the next two successive years, the general trend of prices was steadily downward. As wheat is harvested somewhere in every month of the year, a statistical period called a "crop year" is more or less artificial and phenomena will not always conveniently group themselves within it. Observed over two statistical years in each of the above cases, the relationship between quantity and price fully appears.

The price line of wheat does not show any such regularity of dip and rise within each crop year as is found in the price line of corn; but in the United States there is only one crop of corn in the year and one generally accepted period for comparatively heavy marketings, whereas an explanation of the apparently irregular rises and falls in the price of wheat in an international market would involved a much more complicated inquiry. The study of the course of wheat prices in Canada, in relation to quantities marketed, as presented in the Interim Report, 1916 (pp. 55 to 58), shows sharply defined seasonal variations; an effect from excessive marketings appears every year in wheat prices in the United States; and if the necessary facts could be assembled, the fluctuations in the Liverpool prices would undoubtedly be found to stand in relation to the varying quantities immediately available.

The line of wheat prices (fig. 2) and that of index numbers (fig. 3) tend to approach each other; that is, relatively to general prices, wheat depreciated in price during this period. The quantities of wheat produced in the world increased very greatly in the last five years and evidently somewhat out of proportion to the average of other staple commodities. Corn had appreciated in value with almost stationary average production. In both cases quantity had direct relationship to relative prices.


WORLD'S WHEAT CROP IN RELATION TO PRICES.
FIG. 1 TOTAL WORLD'S PRODUCTION OF WHEAT.
FIG. 2 HIGH & LOW MONTHLY PRICES & AVERAGE BY CROP YEARS. OF CONTRACT GRADE WHEAT AT LIVERPOOL
FIG. 3 BRITISH BOARD OF TRADE INDEX NUMBER OF GENERAL WHOLESALE PRICES
MILLIONS OF BUSHELS
CENTS PER BUSHEL
PERCENTAGES
CROP YEARS
CALENDAR YEARS
1904-05
1905-06
1906-07
1907-08
1908-09
1909-10
1910-11
1911-12
1912-13
1913-14
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
FIG. 1
FIG. 2
FIG. 3
0
1000
2000
3000
130
120
110
100
90
120
110
100
90

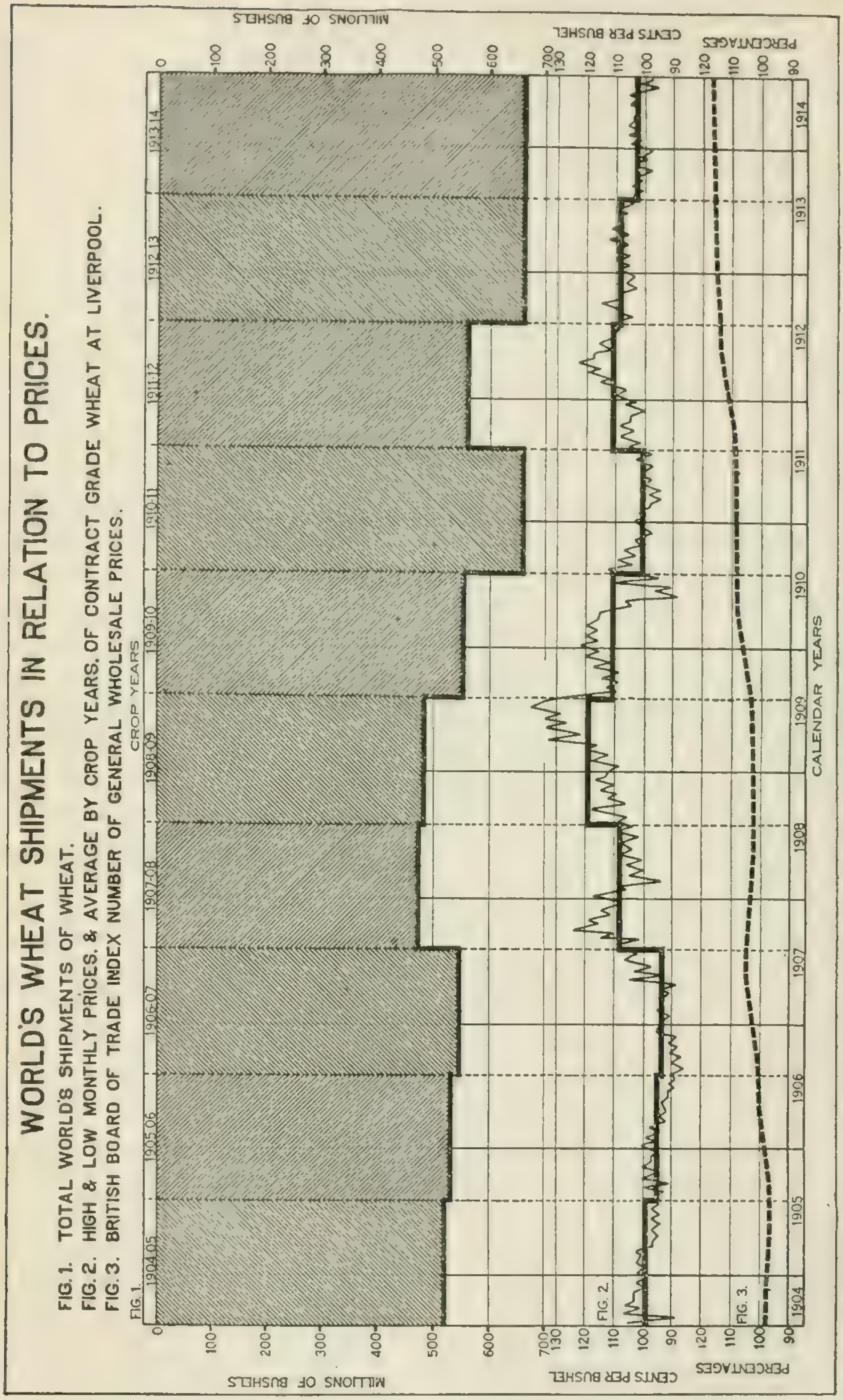
The general relationship of quantity to price in the case of wheat must appear all the more remarkable when it is remembered that it is not possible to know definitely the supplies for any crop year until all the successive harvests are safely gathered, that is, practically until the end of the period. Disappointing crops in some northern country may or may not later be compensated by exceptional yields. In Australia, the Argentine or India. Many differing preliminary estimates are always before the market. Yet so alert and so intelligent is the judgment applied at every stage that the par price line for the season is found, in most cases, almost where it would have been placed by one who afterward reviewed the facts of the year.

These two diagrams furnish an impressive demonstration that, in the world's daily practice quantity and price, with staples of large volume and wide distribution, for which a highly organized market is developed, are almost as intimately correlated as in theory could be assumed by deduction from the law of supply and demand. That the machinery of the world's trade, with its vast extension and infinite complexity, is yet so delicately adjusted and works so truly, must excite not only wonder but respect. It may confidently be laid down that the main factor in determining the basis of wheat prices is the size of the world's crop. After due allowance is made for this factor, comparatively little, at least in respect to the par price line for a season, remains to be explained by market manipulation or other obviously minor forces. Speculation may have important effects when fluctuations for a few days or a few weeks are considered; it may do much harm or it may have its uses in keeping the price line sensitive; but it is a subsidiary and not a dominant factor in the establishment of the basis of price.

In the study of any local problem in wheat prices, such as the probable effect on Canadian prices of free access to the United States market, it is clear that there should be first an examination of local prices in their relation to representative world prices, such as prices at Liverpool. This will show the extent to which world-wide factors, and particularly the size of the world's crop determines the local prices. Marked departures from the line of world prices will suggest local causes, which may then be inquired into, for it will be these local conditions, rather than the general conditions now regulating prices in international trade, that might be affected by tariff or transportation changes in individual countries.

Before proceeding along these lines, however, it would be well to raise the question of the relation of prices to consumption. If quantity available makes price, what effect has price on quantity used? What becomes of a big wheat crop and how does the world manage with a small crop? Some light is thrown upon this question by an examination of the statistics of "world shipments" of wheat, that is the quantities purchased each year by those countries requiring supplies to supplement their local production.

In diagram 6 there are represented for the ten crop years, 1904-5 to 1913-14, the total quantities of world's shipments of wheat (fig. 1), while there are reproduced in figs. 2 and 3, from the previous diagram, prices of contract grade wheat at Liverpool and the British Board of Trade index numbers. In this diagram quantities are to be examined in relation to price and not price in relation to quantities, and the effect of price on international purchases is even more striking than the effect of the world's crop on price. In two years only during the period is there a lack of correspondence in the curves. In 1908-9 the importing countries purchased a little more although the price was higher than in the preceding year, and in 1913-14 they purchased no more wheat than in the year before although the price was lower. Local stocks may have become depleted by the end of 1907-8, during which year importations had been very small, necessitating somewhat larger importations in 1908-9, despite the price; while in 1913-14 there may have been a substantial carryover from the large importations of 1912-13. The varying size and quality of the domestic crops of the importing countries must also be a factor affecting importations. The relationship

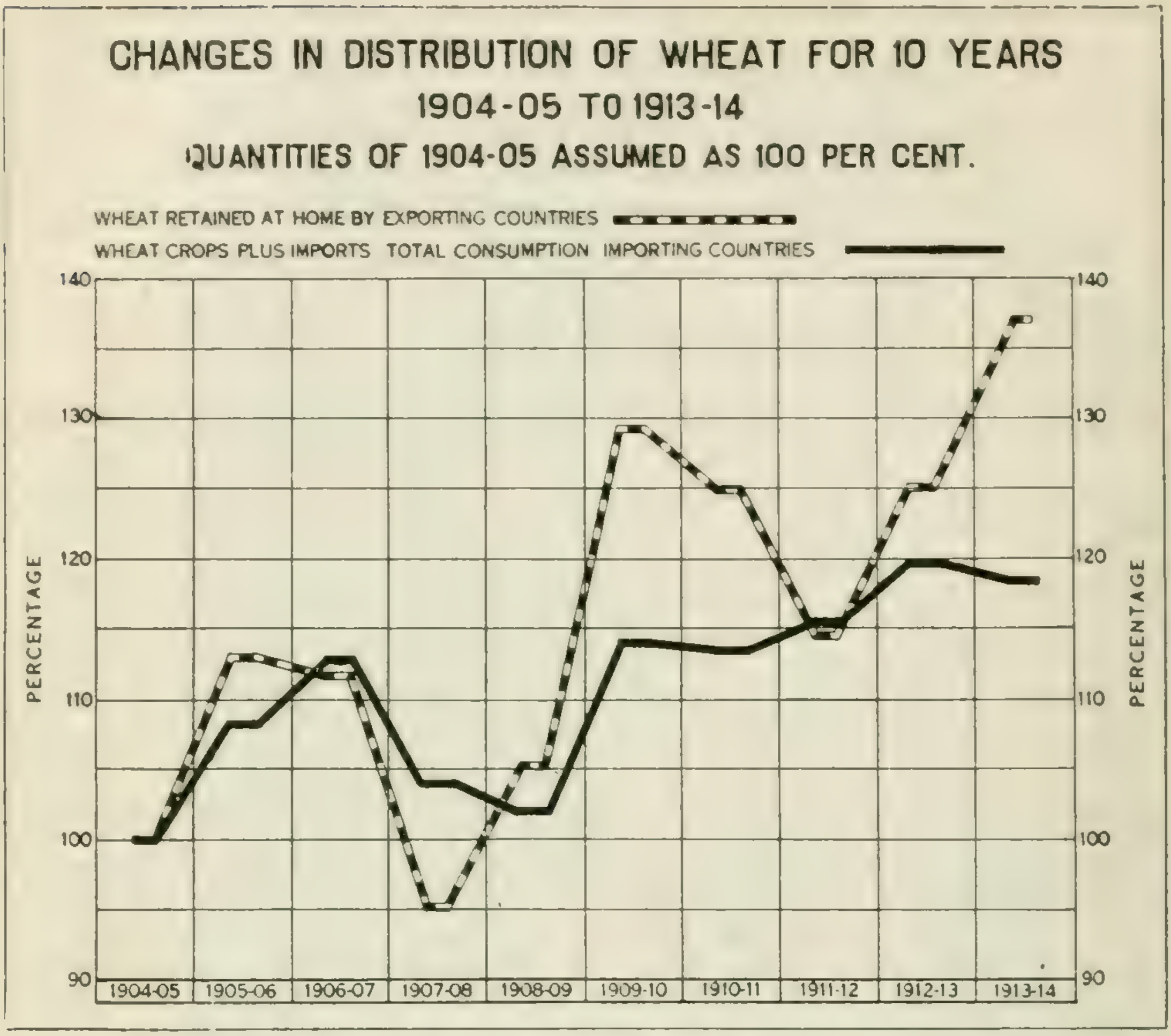

WORLD'S WHEAT SHIPMENTS IN RELATION TO PRICES.
FIG. 1. TOTAL WORLD'S SHIPMENTS OF WHEAT.
FIG. 2. HIGH & LOW MONTHLY PRICES, & AVERAGE BY CROP YEARS, OF CONTRACT GRADE WHEAT AT LIVERPOOL.
FIG. 3. BRITISH BOARD OF TRADE INDEX NUMBER OF GENERAL WHOLESALE PRICES.
MILLIONS OF BUSHELS
CENTS PER BUSHEL
PERCENTAGES
CROP YEARS
CALENDAR YEARS
1904-05
1905-06
1906-07
1907-08
1908-09
1909-10
1910-11
1911-12
1912-13
1913-14
1904
1905
1906
1907
1908
1909
1910
1911
1912
1913
1914
FIG. 1.
FIG. 2.
FIG. 3.

between quantities imported and price is, however, so remarkably direct and, on the whole, so consistent, that all other factors assume minor importance. The users of foreign wheat are careful and intelligent purchasers. The marked increase in the scale of importations in the last few years should be noted in connection with the declining price of wheat relatively to general prices.

Although the importing countries appear to regulate their purchases of foreign wheat according to price, this does not mean that their total consumption of wheat varies in the same proportion. Domestic crops, which constitute about 70 per cent of the supply of these importing countries, must be taken into account. If the domestic crops were substantially equal in any two years, an increase of 10 per cent in the imports in the second year would make an increase of only 3 per cent in the total supply for consumption.

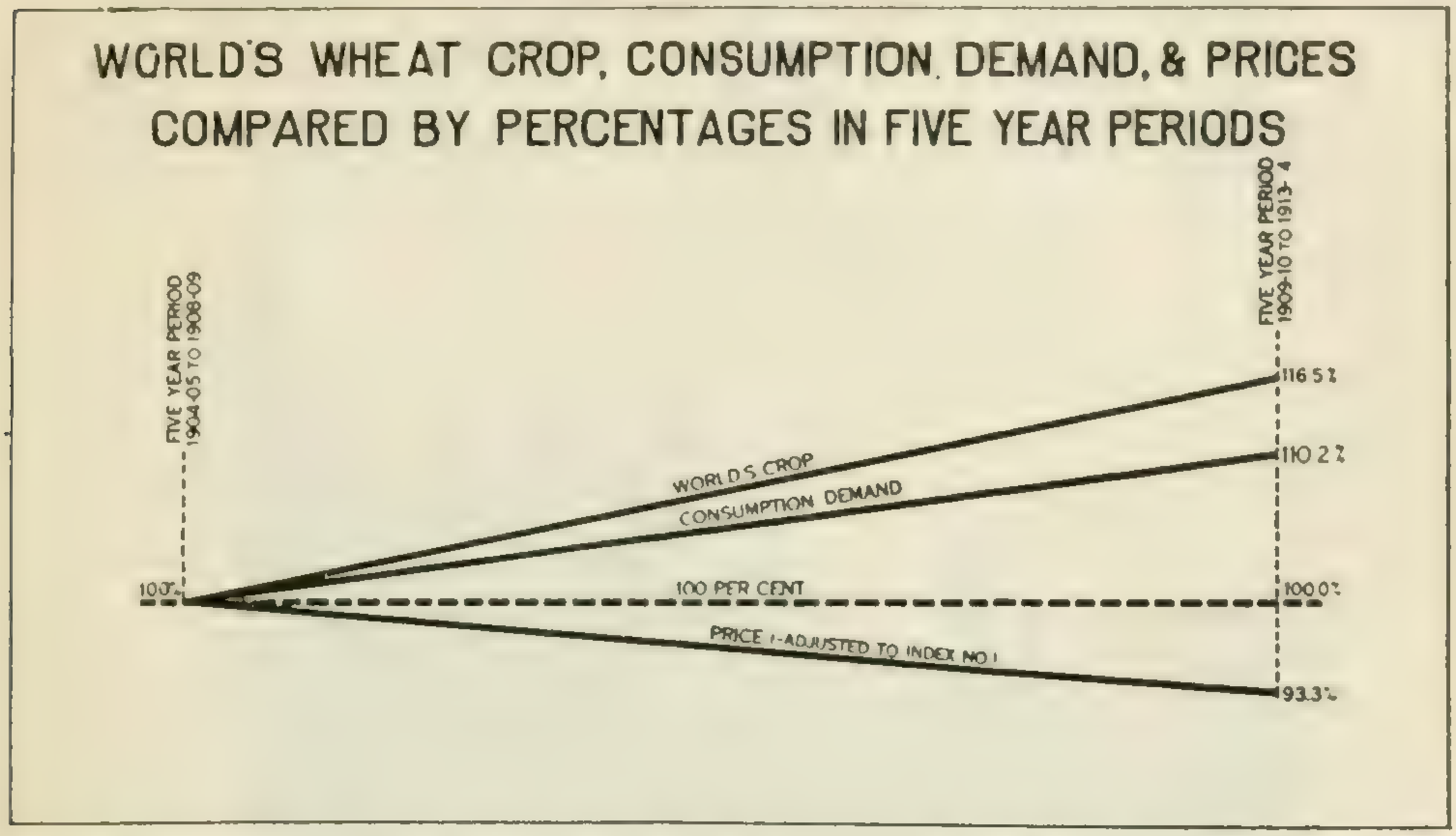
What now is the situation in the exporting countries? The chief variations in the world's crop are caused by the variations in the crops of the exporting countries; but the exports are so small a proportion of these crops that the fluctuations in the exports are very far from absorbing the fluctuations in the crops. In 1909-10 the crops of the exporting countries were over 420,000,000 bushels greater than in 1908-9; but at the lower price the importing countries took only 70,000,000 bushels more, leaving the exporting countries over 350,000,000 bushels more than in the previous year. Again in 1907-8 the importing countries, at a higher price, took 70,000,000 bushels less than in 1906-7; but the crops of the exporting countries had been about 300,000,000 bushels less, so that the exporting countries were left with about 230,000,000 bushels less than in the previous year. In 1909-10 the exporting countries retained at home about 500,000,000 bushels more than in 1907-8, just two years before; whereas the difference in the quantity used by the importing countries in these two years was only about 160,000,000 bushels. Such violent fluctuations in the quantities of wheat retained by the exporting countries cannot be explained on the ground of changes in the populations of the exporting countries or changes in real economic demand, due to differences in price or in financial conditions (see Table No. 6, p. 88).

The question may be raised whether the varying amounts retained at home by the exporting countries depend upon the varying proportions of their crops below milling quality. Any wheat that will not produce a flour satisfactory to some market is not likely to be purchased for export in any considerable quantities, and particularly if transport over long distances is involved. To establish the facts necessary to a complete understanding on this point would involve a very difficult investigation, which has not been attempted. So far as Canada is concerned, the total quantity of non-millable wheat was not great enough in any year in this period to account for differences in amounts retained at home, and these differences were not proportioned to the relative quality of the crops. The crop of 1905 was much better in quality than that of 1904 and yet much more was retained at home. The crop of 1906 was of high average quality, while the crop of 1907 was much below the average quality, and yet 87,000,000 bushels was retained at home, of the former crop, and only 46,000,000 bushels of the latter. On the other hand, the large crop of 1911 was the poorest of all in average quality, although the percentage of "feed" wheat was smaller than in 1907, and yet 118,000,000 bushels was retained at home in that crop year. All the different years may be compared with each other in the same way without discovering any fixed relationship between quality and amounts retained at home. The same would probably be found to be true with the other exporting countries. The aggregate amounts retained at home are large in the years of large world's crops and there is no necessary connection between size and quality. The proportions taken from each exporting country are probably more affected by conditions of transportation or finance than by the relative quality of the crops of those particular countries.



In diagram 7 the quantities retained at home by the exporting countries are represented by a broken line, and the sum of the domestic crops and imports of the importing countries by a solid black line. The quantities in each case are represented as percentages, the quantities of the first year being taken as 100 per cent. As, for the whole period, the total quantities retained by the exporting countries and those used by the importing countries were substantially equal, comparison by this form of representation may fairly be made. The fluctuations in the quantities retained by the exporting countries are too extreme to be explained by changes in the consumption needs of the populations of these countries. Moreover, these fluctuations are frequently out of relation to price and cannot therefore be explained on obvious economic grounds. In 1906-7, for example, less was retained than in 1905-6, although the price was lower; in 1908-9 much more was retained than in 1907-8, although the price was considerably higher; and in 1910-11 less was retained than in 1909-10, although the price was much lower. On the other hand, the line of quantities used by the importing countries conforms, with two or three slight exceptions in the later years, rather closely to the course of prices. Apparently the importing countries take from the exporting countries what wheat they can use at the price and the balance is left in the hands of the exporting countries.

It may be that in every year of the period, unless perhaps in 1907-8, the exporting countries were left with more wheat than could be used in the form of flour by those countries, and in 1909-10 and 1913-14 the quantity must have been much greater than

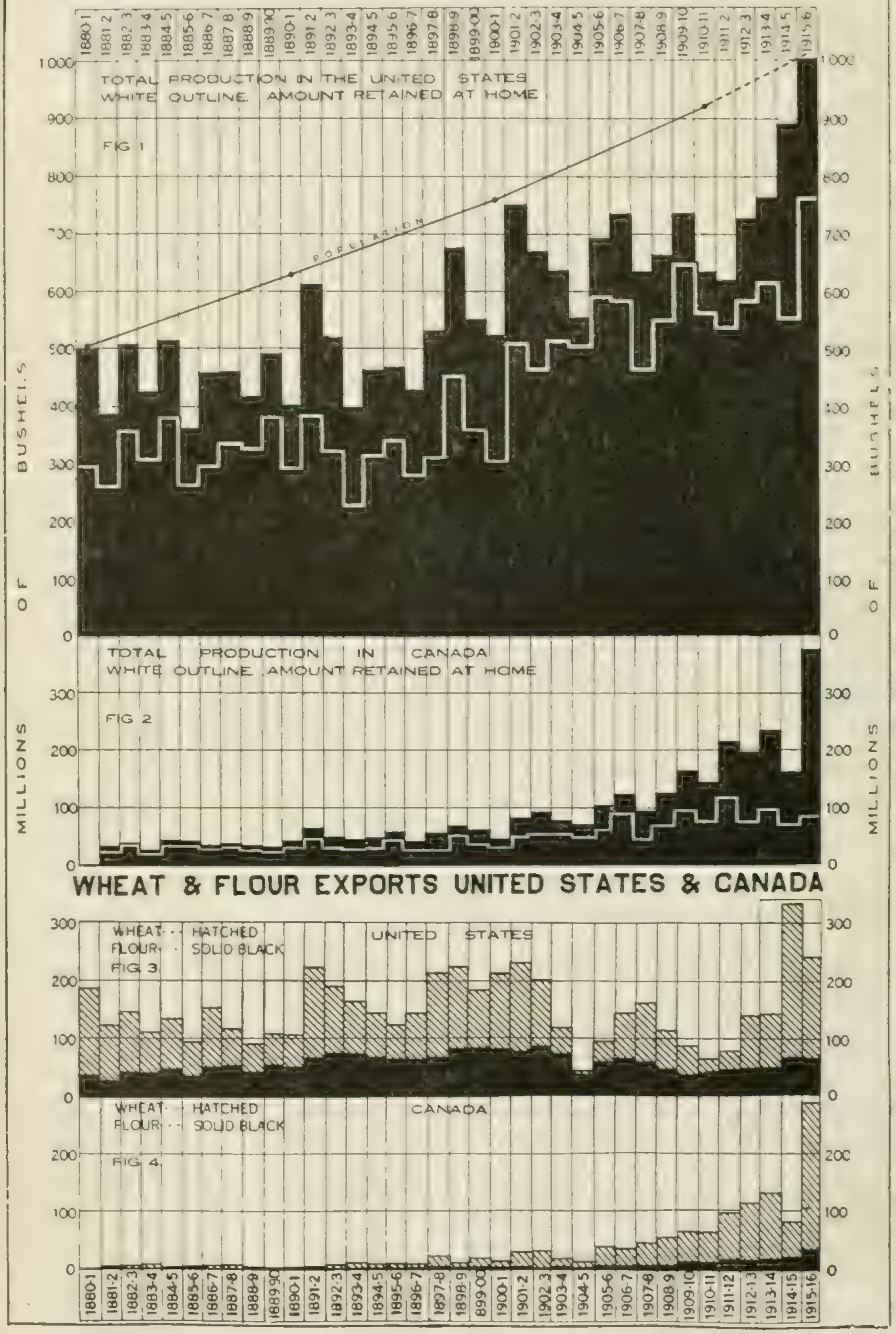


flour requirements. An examination of the quantities retained by each exporting country, separately, shows an entire absence of uniformity. Owing to conditions that were no doubt clear enough to foreign purchasers at the time, more or less is taken from each exporting country without strict regard to the surplus in that particular country. The line of Canadian quantities retained at home is among the most erratic of all.

The importing countries buy according to price; the exporting countries retain what is not thus bought, which may leave them a varying and uncertain excess above their own flour requirements. How to use this excess profitably and with the least damage to price is one of the problems of wheat.

Before leaving the general relationship of quantity and price, one further presentation of facts may be offered. Brought together, as in diagram 8 these facts are suggestive. The main assumption is that the world's economic demand for wheat is correctly represented by the varying rate of consumption of the importing countries and not by that of the exporting countries. The importing countries must buy to supplement local products and it is clear that their total supplies must represent the economic demand for wheat in those countries; while the wheat left in the exporting countries cannot be regarded as a direct measure of economic demand. The importing countries include many progressive nations of expanding populations and on the whole they do not differ so very widely in general character from the exporting countries. If then, the varying rates of consumption in the importing countries be applied to the whole world to represent the real economic demand for wheat, the world's crop is seen to have increased faster than this economic demand, and the price of wheat, adjusted to the value of money, to have declined, and the percentage in both cases to have been almost exactly equal. To afford a broader and fairer basis of comparison than individual years, the ten years are divided into two periods of five years each. The total quantity of wheat produced in the world in the second five years was 116·5 per cent of the quantity produced in the first five years; that is, there was an increase of 16·5 per cent in production. The consumption of the importing countries was greater in the second five years by 10·2 per cent and this is

WHEAT PRODUCTION OF UNITED STATES & CANADA
WITH AMOUNTS EXPORTED & RETAINED AT HOME
1880-1916



assumed to be the rate of increase of economic demand in the world. Production increased faster by economic demand by 6·3 per cent. If average prices for the two periods are corrected year by year according to the level of general wholesale prices, it is found that the adjusted prices for the second period averaged 93·3 per cent of the prices for the first period; that is, there was a decline in price of 6·7 per cent as against an excess of production of 6·3 per cent. Appreciation and depreciation of the price of wheat relatively to general average prices illustrate the relationship of quantity to price.

UNITED STATES PRODUCTION, CONSUMPTION AND EXPORTS.

The United States has been, and still is, the world's greatest producer of wheat. Its yearly production and exports from 1880-81 to 1915-16, as compared with those of Canada, are shown in diagram 9. In fig. 1 of this diagram the total heights of the columns represent the yearly production, while between the base and the superimposed white line are the quantities retained at home during each crop year, the portions of the columns above the white line indicating the quantities exported as wheat and flour. This diagram takes account only of domestic products, but in any case, the balance of foreign breadstuffs retained in the United States is on the average so small as to have no appreciable effect.

Fig. 2 gives the corresponding statistics for Canada and a comparison of figs. 1 and 2 will convey to the eye the relative positions of these two countries as producers, consumers and exporters.

In figs. 3 and 4 the exports of the two countries are reproduced upon straight bases, each column being divided into exports of wheat (hatched) and exports of flour, reduced to its equivalent in bushels (solid black).

An important fact brought out by fig. 1 is the marked upward tendency of average production in the United States during the period. Above in this figure is the line of the growth of population in the United States, according to the census returns, and for the last five years according to official estimates. It is apparent that production in the United States has kept pace with the increase in population. Taking average production and average population by census periods, the following are the facts:—

UNITED STATES PRODUCTION OF WHEAT.

Period.	United States production of wheat. Average yearly production.	Per head. of average population.
1880-81 to 1889-90	449,695,300	7·95
1890-91 to 1899-00	503,077,915	7·24
1900-01 to 1909-10	659,509,254	7·84
1910-11 to 1915-16	465,262,800	8·06

The smallest production in relation to population was in the second decade, but during the last sixteen years production has increased and the number of bushels per head during the last six years was greater than during any previous period. Even if there be added to the figure the year 1916, with the third largest acreage on record but the small yield, owing to partial crop failure, of 639,886,000 bushels, and an average be struck for the seven years since 1909, the production per head would be 7.85 bushels, which would still be a little better than for the previous decade. Judged by the number of possible domestic consumers, production in the United States has been fully maintained.

Considering, now, the quantities retained at home, that is quantities between the base and the white line, the irregularity, to which reference has previously been made, may first be noted. The irregularities in Canadian quantities, if judged by percent-

ages, are more extreme than in the case of the United States. It is not probable, as pointed out, that these irregularities can be wholly explained by changes in the economic conditions in the United States, or in Canada, or by differences in the quality of the crops, the chief cause being the changes in foreign demand. In many cases fluctuations in the Canadian line correspond with fluctuations in the United States line, but in many cases the movements are opposite. Per head of population, the quantities retained by the United States and by Canada were as follow:—

WHEAT RETAINED AT HOME.

Period.	Wheat retained at Home. Average Quantity.	Per Head of Average Population.
United States.		
1880-81 to 1889-90	322,179,591	5·69
1890-91 to 1899-00	330,033,341	4·75
1900-01 to 1909-10	516,759,794	6·14
1910-11 to 1915-16	606,511,648	6·30
Canada.		
1881-82 to 1890-91	35,803,761	6·92
1891-92 to 1900-01	52,992,191	7·70
1901-02 to 1910-11	109,124,264	10·77
1911-12 to 1915-16	237,072,388	12·00

Out of the quantities retained at home seed must be provided and the balance, less any unmillable wheat, is available for human consumption. Deducting the quantities required for seed, at 1½ bushels per acre (although Canadian statistics generally allow 1¾ bushels), the balances in both countries by periods, per head of population, were:—

United States. Period.	Balance per head. Bushels.	Canada. Period.	Balance per head. Bushels.
1880-81 to 1889-90	4·71	1881-82 to 1890-91	
1890-91 to 1899-00	3·93	1891-92 to 1900-01	6·69
1900-01 to 1909-10	5·31	1901-02 to 1910-11	9·21
1910-11 to 1915-16	5·51	1911-12 to 1915-16	10·00

The use of wheat in the United States decreased in the second decade but became much greater in the last two periods. By the diagram (fig. 1, white line) it is seen that there are two distinct levels in the quantities available for home consumption, the year 1901 marking the change to the higher level. It is interesting to note that in 1901 there was a record crop of wheat, but both the corn crop and the potato crop were deficient and the prices of these latter products exceptionally high. The change in price in these two partial substitutes for wheat may have led to a much greater use of the latter and it would appear that wheat afterwards maintained its new place in the dietary. As the result of an inquiry in 1910, the United States Department of Agriculture estimated that it would take 5·3 bushels of wheat to make the quantity of flour consumed per capita in the United States in that year. Wheat is used almost exclusively for seed and for flour in the United States and there is little waste.

Canadians may eat a little more wheat flour than the people of the United States, but they cannot eat 10 bushels per head per year. Canadian statistics, previous to the special census of manufactures in 1915, do not record the number of barrels of flour manufactured in the country. In 1915, however, the flour made in Canada amounted to 14,267,424 barrels. During the year there were exported 5,568,750 barrels. It is not possible to tell what stocks were carried over from the previous year or what were carried forward at the end of 1915, but the difference between the flour milled and the flour exported, 8,672,194 barrels, would represent a little less than 1⅓ barrels per head, that is, a little less than the equivalent of 5.4 bushels of wheat per head, or practically the exact quantity estimated as consumed per head in the United States in

1910. By using stocks on hand Canadians may, in 1915, have consumed more than 5.4 bushels per head in the form of flour, but it is certain that Canada has not been milling enough wheat to provide for the recorded exports and also for a home consumption of anything like the equivalent of 10 bushels per head. If the approximate accuracy of official estimates of production can be assumed, Canada must feed large quantities of wheat to animals and, as it is not probable the percentage of unmillable wheat is higher than in the United States, Canada must feed much good wheat, or there must be large wastage in some way.

The United States has had a considerable surplus for export every year. (See also Table 9, p. 91.) By periods the figures are as follow:—

UNITED STATES AVERAGE EXPORTS PER YEAR.

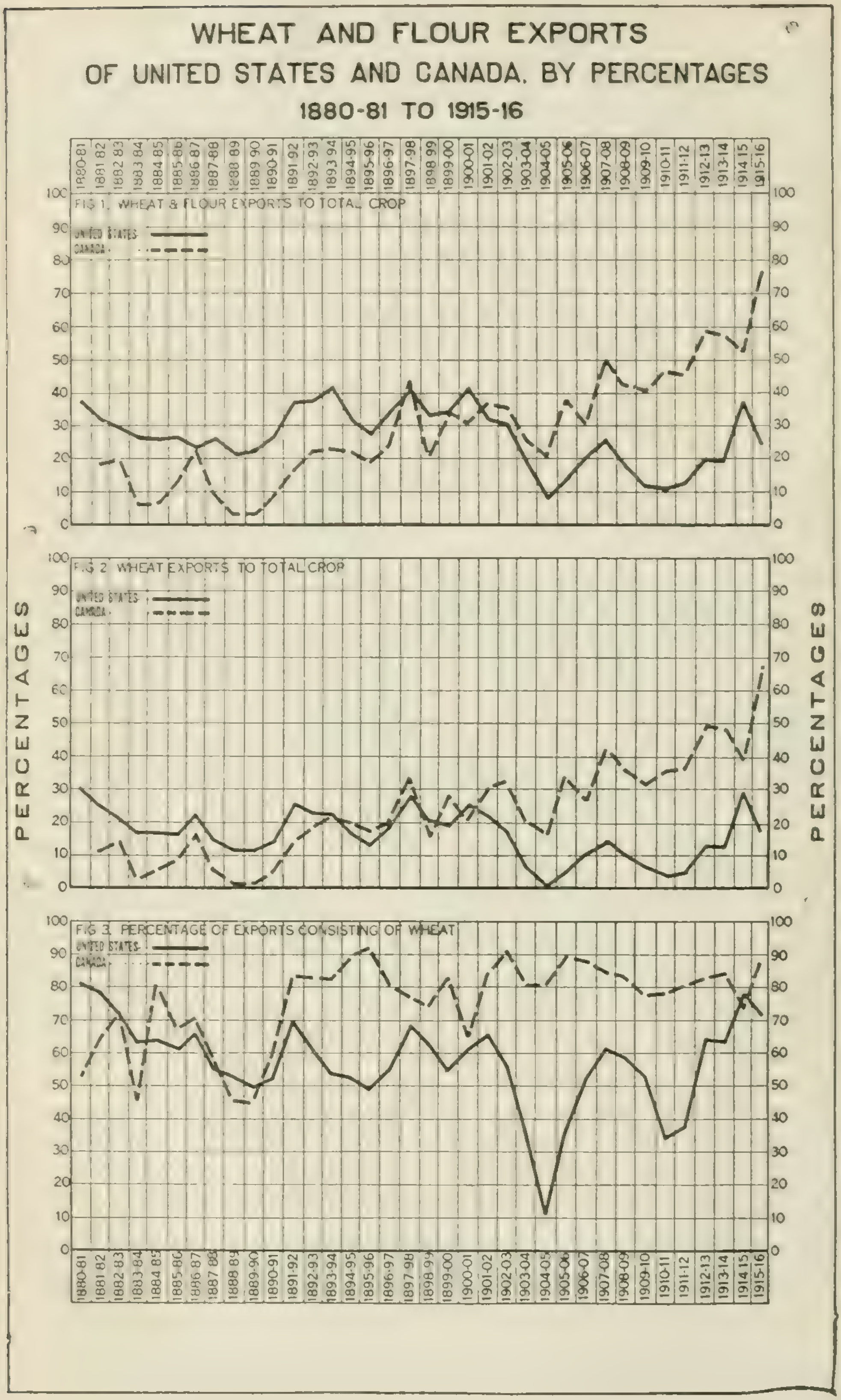
Period.	Wheat.	Flour.	Total Wheat and Flour.	Per head Population.
	(bushels)	(bushels)	(bushels)	(bushels)
1880-81 to 1889-90	83,354,814	43,260,893	126,615,707	2·24
1890-91 to 1899-00	102,387,790	70,656,782	173,044,572	2·50
1900-01 to 1909-10	77,523,965	65,225,494	142,749,459	1·69
1910-11 to 1915-16	111,800,468	57,041,716	168,842,184	1·75

It is interesting to note that the largest average export occurred in the second decennial period, which was the period of the smallest production per head of population but also of the smallest domestic consumption. Taking individual years, the smallest export was in 1904-5, a year in which, as in 1916, black rust seriously affected the quantity and quality of the crop of Northern Spring wheat. The largest export was in the first year of the war, 1914-15, with the enormous total of 332,464,975 bushels of wheat and flour. This is the greatest export ever made by one country and to appreciate its magnitude it is only necessary to point out that it is equal to almost exactly 60 per cent of the normal yearly demand of all importing countries. This export was made out of a crop of 891,017,000 bushels. The crop of 1915 was much larger, amounting to 1,011,505,000 bushels. But for the accident of wet weather at harvest time, which caused some damage, the United States could have supplied, that year, 70 per cent of the world's normal import demand; and other conditions besides the damage must be looked to for the explanation of the fact that only 213,117,025 bushels was actually exported within that crop year, one of these conditions being the extent to which the needs of Great Britain and our Allies were met by their heavy purchases from Canada's magnificent crop. Canada's exports in 1915-16 of 289,136,040 bushels of wheat and flour, equal to a little over 50 per cent of the world's normal import demand, is the second largest export ever made by one country.

The United States has apparently been able to increase its wheat acreage to meet its own increasing needs and provide an important surplus in every year. Its yield per acre has been low, ranging from 10·2 bushels in 1881 to 16·9 bushels in 1915. It should be easily possible, by the development of intensive fertilization, to double the average yield of this period. On the facts there would seem to be no reason to suppose that the United States cannot continue for a long time to be self sustaining, and more—provided the relative price of wheat makes it worth while to devote land and labour to that purpose.

Canada's exports of wheat and flour after 1904 show a very rapid increase, culminating in a total for the year 1915-16, which was equal to over 48·47 per cent of the actual world's shipments for the twelve months of that Canadian crop year, or more than half the average world's shipments before the war. The export trade has

WHEAT AND FLOUR EXPORTS
OF UNITED STATES AND CANADA, BY PERCENTAGES
1880-81 TO 1915-16



become relatively of far greater importance to Canada than to the United States. In the ten years, 1901-2 to 1910-11, Canada exported on the average a little over 6½ bushels per head of population, as compared with 1·69 bushels per head by the United States, and in the last five years Canada exported 19 bushels per head, as compared with 1·75 bushels per head by the United States. A much larger part of the productive energy of the Canadian people is devoted to wheat and flour that goes for export, than is the case with the people of the United States. Indeed, since about 1907 Canada, per head, has produced more for export than has the United States for all purposes. Because a larger proportion of its wheat crop has been exported by Canada since 1901, the foreign market may tend to exercise a somewhat greater influence upon prices and other conditions in the Canadian wheat trade than in that of the United States.

In diagram 10 certain percentage changes are worked out for the period covered in the previous diagram. In fig. 1 total wheat and flour exports of the two countries are shown as percentages of the total crops grown. Before the western wheat fields were developed Canada exported a smaller percentage of its crop than did the United States, but after 1901 a marked change took place and since then, on the average, the United States has exported 20 per cent of its crop, while Canada has exported over 43 per cent, and in 1915, 76·5 per cent. In fig. 2 exports in the form of wheat are shown as percentages of the total crops. Since 1901 Canada has exported over 36·42 per cent of its total crop in the form of wheat and 7·37 per cent in the form of flour. The export flour trade, relatively to the export wheat trade, has therefore been much more important with the United States than with Canada. In fig. 3 the percentages of wheat to the total exports of wheat and flour are shown. Since 1901 wheat constituted, according to the average of yearly percentages, only a little over 52 per cent of the United States exports, and flour about 48 per cent, while wheat constituted over 83 per cent of the Canadian exports and flour less than 17 per cent.

Flour Exports.—A little fuller examination of the facts relating to the export of flour may be desirable. The United States and Canada are the two largest contributors to the world's shipments of flour and the very long lead which has been held by the United States over its nearest competitor appears by a comparison of the solid black portions of figs. 3 and 4 in diagram 9.

The outstanding features of the United States flour exports are the tendency towards an increase from the beginning of the period until the years 1902 and 1903, and then the marked drop to a lower level of export for the balance of the period. The expansion of the flour exports in the last two years may or may not be found to have been due chiefly to war conditions. The years of greatest exports were 1898-9 to 1903-4. Each of these six years had a greater export than any year before or since. There are thus two clearly defined periods, one before and the other after 1904.

Canadian flour exports since about 1902 have shown a steady tendency towards increase. The volume is not large as compared with that of the United States, but whereas in 1903-4 the Canadian exports were equal to only 8·62 per cent and in 1904-5 to 12·12 per cent of those of the United States, in the year 1914 they had become 36·58 per cent as great.

These facts should be viewed in the light of developments in the international flour trade taken as a whole. The following are the statistics of aggregate exports of flour by all countries, as given in the Year-books of the Department of Agriculture of the United States, compiled for calendar years:—

WORLD EXPORT OF FLOUR.

Year.	Barrels.	Year.	Barrels.
1903	27,078,185	1909	23,366,323
1904	21,044,428	1910	23,436,898
1905	22,796,939	1911	26,896,764
1906	25,143,001	1912	27,805,000
1907	26,704,435	1913	31,324,000
1908	24,178,183		

The volume of international trade in flour had been tending to increase for many years, prior to 1902 and 1903, but there then occurred a sudden decline, as indicated by the above figures, and although the earlier volume of trade had been fully restored by the year 1912, it is evident that the international flour market has been subject to restricting influences and in recent years has shown no marked capacity for expansion. Yet the combined trade in wheat and flour, as already noted on pages 23-25, manifested, during all this period, a decided tendency to increase. This means that importing countries satisfied their increasing needs by taking more wheat and proportionately less flour. Wheat exports in the calendar years 1909-13 were 21·69 per cent greater than in the five years 1904-8, while flour exports were only 10·8 per cent greater. Flour constituted about 17·5 per cent of the combined total shipments in 1904-8, but was less than 16 per cent of the total in 1909-13.

Flour exports have quite a different distribution from wheat exports. Under the heading of "exports of domestic merchandise from the United States by articles and countries", the Department of Commerce at Washington reports shipments of flour to some eighty political or geographical divisions of the world, but shipments of wheat to only about half that number. Canada reports exports of flour to some fifty countries, but wheat to less than twenty countries. While these figures are not directly comparable because the classification of countries is not identical, there is no doubt that the United States has a much wider distribution for both its wheat and its flour than has Canada and that with both countries the distribution for flour is much wider than that for wheat.

With the exception of the United Kingdom, which is the largest importer both of wheat and of flour, and the Netherlands, which is a relatively large importer of both, the countries importing the largest quantities of wheat are not the leading importers of flour. European countries take nearly 95 per cent of the world's shipments of wheat but less than 50 per cent of the world's shipments of flour. During the twelve years before the war the Netherlands imported more than twice as much flour as any other country in continental Europe, Finland standing second in the list with imports more than twice as great as Denmark, which stood third. Several ex-European countries, such as Brazil, Egypt and China, took more flour than Finland, and Cuba and British South Africa took more than Denmark. Trinidad was a bigger flour market than Germany, France, Italy, Spain or Sweden. International trade in flour is not distributed, as that in wheat is, according to the need of the various countries for imported breadstuffs, but according to the stage of development of the local milling industries and the natural and artificial advantages these industries may possess.

It is in the power of any country, by tariffs, to limit, to the point of exclusion the importation of foreign flour. The United Kingdom, the Netherlands, and Denmark are the only important countries of Europe which levy no duties on either wheat or flour and in Finland the duty upon a barrel of flour is only about ten cents greater than the duty upon the 4⅓ bushels of wheat necessary to make a barrel of flour, and these four countries are the largest European importers of flour. There can be no doubt that tariffs play a very important part in the international flour market. Every country recognizes the value to itself of the milling industry, because of the employment it may give to labour and capital because it assures a supply of offal for animal feed, and because the ability to convert the raw materials into a form suitable for use lessens to that extent the dependence on other countries. It is a matter of national policy with most countries, therefore, to encourage the milling industry by imposing a higher duty on flour than on the corresponding quantity of wheat.

Whether or not a mill in Europe, say, is given a measure of protection by legislation, it has certain other advantages over a mill in a foreign country which attempts to compete with it in its local market. In the first place it has a wider selection of

wheats to be milled. The mill in the foreign exporting country must tend to be confined to local wheat, since if it imported wheat and then exported the flour the product would be subject to two freight charges, whereas the importing country can obtain any wheat grown in the world at a single charge. Now the wheat crop in one country may, in any year, be deficient in quantity or poor in quality, while some other countries have excellent crops. The exporting miller may therefore at times have difficulty in maintaining the standard of his flour, or be obliged to pay more than the world average price for the local varieties of wheat he must have. The European miller, by establishing his trade with a brand of flour made from a mixture of wheats, can, with slight alterations in the mixture, not noticeable in the product, keep within average costs for wheat and maintain average quality. Again, he is in closer touch with local consumers and can adapt his blend of flour to local taste, or with his more complete selling organization can educate local taste to his flour, and thus not only sell more flour than the exporting miller, but sometimes sell at a higher price. Then, his market for the offal, which is between 25 and 30 per cent of the product, is generally better than that of the miller in the exporting country. If the milling plants and processes in both countries are equally efficient, the mill in the importing country is thus in a good competitive position, and it has one other definite advantage in the relative ocean freight rates on wheat and on flour. Wheat nearly always bears a lower freight rate than flour or than offal, and very often it is possible for the European miller to import enough wheat to make a barrel of flour at no greater freight cost than the exporting miller must pay on his barrel of flour. In that case the European miller gets his offal without freight cost and can sell it in a market where prices are determined by the cost of imported offal. Any freight differential in favour of wheat gives a proportional advantage to the miller in an importing country.

Japan, adding to the other advantages of its millers a clear margin of protection on flour of 58·2 cents per barrel, cut down its imports of flour from 1,411,611 barrels in 1903 to 195,000 barrels in 1913. Germany, with a margin of protection of 55·6 cents per barrel, gave to its millers the still further assistance of a bounty on exports, with the result that it, the second largest importer of wheat, became the world's third largest exporter of flour, ranking next after the United States and Canada, and built up a milling industry amply adequate for its own needs against the time of war. In the United Kingdom, where there has been no legislative assistance, the millers, by the improvement of their plants and methods, have been able to turn the other advantages to such good account that the imports of flour have been reduced from 12,901,000 barrels in 1901 to 5,748,000 barrels in 1914, and exports of domestic flour have shown substantial increases. In the five year period 1899-1903, according to the average of yearly percentages, the United Kingdom took 22·4 per cent of its requirements in the form of flour and 77·6 per cent in the form of wheat, while in the period 1910-1914 it took only 9·42 per cent in the form of flour and 90·58 per cent in the form of wheat (See table No 7, p. 89).

The greatest single change in the international flour market in recent years has been this very serious curtailment of British imports. From absorbing one-half of all the world's exports of flour, the United Kingdom became the purchaser of only a little over one-fifth. The United States has been affected by the changed conditions more than has any other exporting country. Indeed it is the only country having a surplus of wheat which has shown a decline in flour exports. With superior equipment and organization, the United States had made itself the dominating factor in the flour trade and in 1913 contributed 72 per cent of the world's exports. Other countries, however, began to build thoroughly efficient plants and to avail themselves of all favourable conditions and by 1909 were supplying about 60 per cent of the world's shipments, leaving as the United States' share only about 40 per cent, though this is still a very large percentage for any one competitor to provide.

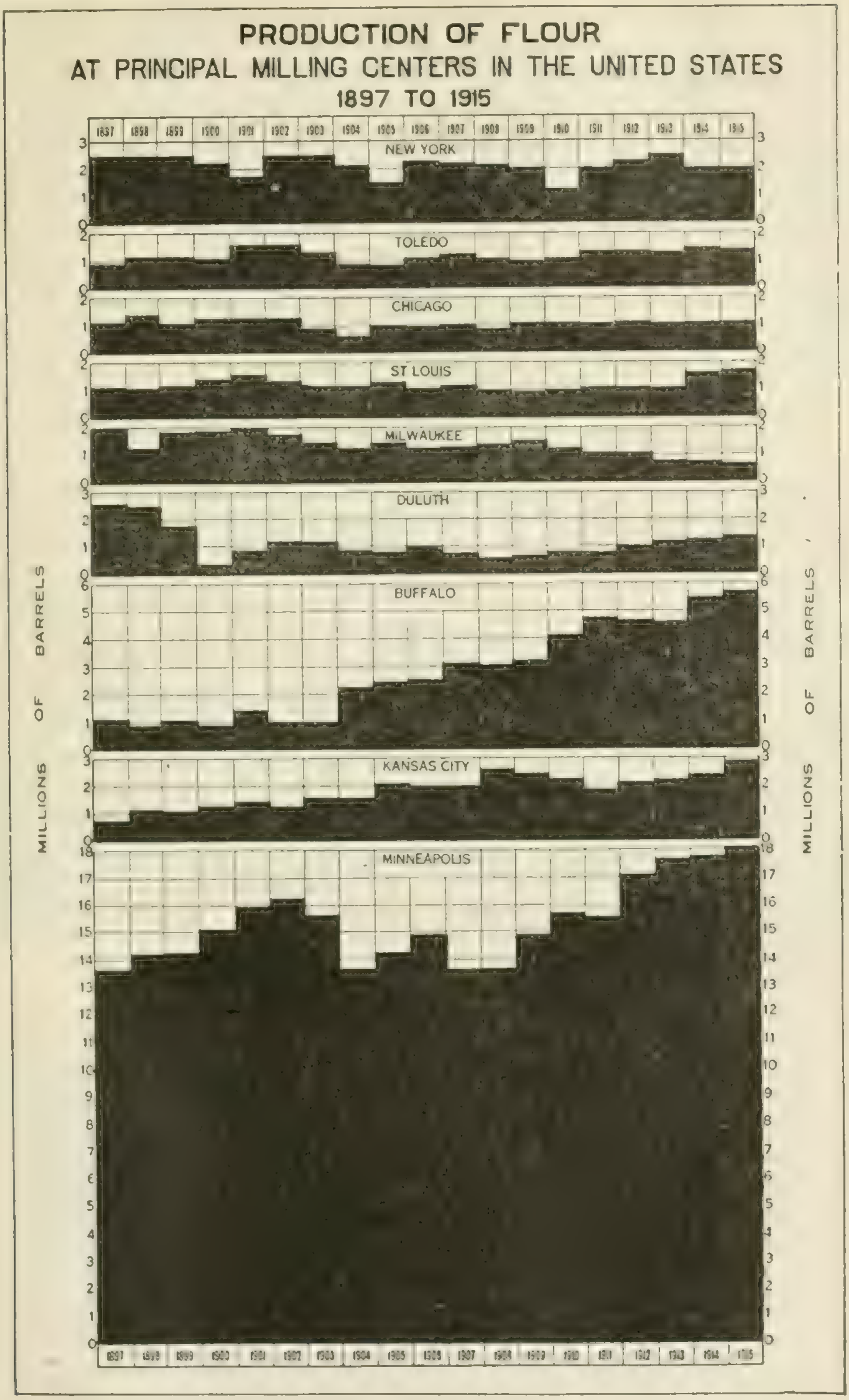
In the crop year 1904-5 the United States, in addition to facing a growing strength in the position of foreign mills, encountered one of those positive disadvantages, which, as mentioned above, are liable to be met by the millers in exporting countries. Black rust, in that year, greatly reduced the yield and damaged the quality of the Northern Spring wheat crop which was the staple of the chief exporting mills, and in bidding against each other for the good wheat these mills forced the cost of their raw material far above the export basis. Unquestionably there is in this fact the explanation of the abruptness of the decline in United States exports in that year, and of the decline in the total world's shipments, since other exporting countries were not able to take instant advantage of the opportunity. Local mills in the importing countries had their chance to make good the deficiency, and the development of milling in other countries, which had already begun to show its effects, was greatly stimulated. Even in 1905-6 and 1906-7, with ample supplies of wheat at satisfactory prices, the United States' Northern Spring wheat mills did not recover their former position in the export trade, and they again met difficulty with supplies or price for the greater part of the period from 1907 to 1912. There were periods also in which similar difficulties existed for the millers relying upon the leading varieties of winter wheat. These difficulties are not abnormal, although they may be only occasional, factors.

The great strength of the present position of the United States as a competitor in the flour trade is that its exports are only a little over 10 per cent of the output of its mills, a mere fractional surplus, which it must often pay to produce if only because it may represent a more efficient operation of the mills, but which it can never pay to leave upon the home market. The United States exports of wheat breadstuffs since 1904 have consisted of 51·10 per cent wheat and 48·90 per cent flour, whereas the importing world has taken about 83 per cent wheat and 17 per cent flour. (v. Tables 8 & 9, pp. 90-91.)

Canada, the second largest exporter of flour, has increased its exports more steadily and at a greater rate than any other country. Exports in 1909-13 were over two and one-third times the exports in 1904-8. By bounties Germany doubled its exports in the same time, but the volume was only a little over one-half of that of Canada. The Balkan States showed an increase of 63·55 per cent, the Netherlands of 48·45 per cent, Russia of 41·06 per cent, and all other exporting countries still smaller increases. In 1908 Germany became the third largest exporter of flour and held that position until the war. Australasia, which had been in the third position, then took the rank as fourth, with the Argentine fifth, Russia sixth, the Balkan States seventh, the United Kingdom eighth, Belgium ninth and British India tenth. In 1904-8 Canada's exports of wheat breadstuffs consisted of 85·72 per cent wheat and 14·28 per cent flour and in 1909-13, despite the very great increase in its surplus wheat production, the percentages were 81·37 wheat and 18·63 flour, which is a little larger percentage of flour than prevails in international trade taken as a whole. Canada may be said to be doing a normal export business with the full normal proportion of flour and the altogether disproportionate flour shipments of the United States, and the flour exports of the countries which do not produce surpluses of wheat, such as Germany, Great Britain, and Belgium, have not, therefore, been at the expense of Canada and only to a small extent at the expense of Australasia, but chiefly at the expense of Russia, India, the Argentine and the Balkan States.

As the result of restricted export trade the output of the merchant mills of the United States has shown only very moderate increase and has not kept pace with the growth of population. In 1899 these merchant mills ground 6.34 bushels of wheat per head of population, while in 1914 the quantity dropped to 5.51 bushels.

In diagram 11 there are presented statistics of the principal milling centres of the United States from 1897 to 1915. The only three centres to show a tendency toward increase of output are placed together at the bottom of the diagram; and that


PRODUCTION OF FLOUR
AT PRINCIPAL MILLING CENTERS IN THE UNITED STATES
1897 TO 1915
NEW YORK
TOLEDO
CHICAGO
ST LOUIS
MILWAUKEE
DULUTH
BUFFALO
KANSAS CITY
MINNEAPOLIS
MILLIONS OF BARRELS

Minneapolis, Kansas City, and Buffalo should be the three points is interesting and significant, Minneapolis being a primary point in the Northern Spring wheat district, Kansas City being a primary point in the winter wheat district and Buffalo being situated on the lake-and-rail transportation route for both varieties of wheat. The effect on the Minneapolis output of changed conditions in international trade beginning about 1904 is clearly marked, direct export trade of Minneapolis declining from an average of 3,533,624 barrels for the twelve years before 1904 to an average of 1,763,591 barrels between 1904 and 1915 (see table 11, p. 93). The requirements of the home market, and the place which flour made largely from Northern Spring wheat occupies in that market, will account for the subsequent recovery in business for Minneapolis, but it is apparent that Minneapolis, and probably Buffalo, have absorbed part of the share of business formerly done at such points as Duluth and Milwaukee. Corresponding statistics for the principal milling centres in Canada are unfortunately not available (see table 10, p. 92).

On the basis of the Canadian special census of 1915 and the United States special census of 1914, Canada was milling per head of population, between 50 and 60 per cent more flour than the United States and also exporting three or four times as much. In proportion to population Canada mills and exports more flour than any other country. In 1915 its exports of flour were equal to 39 per cent of the quantity milled in that calendar year; whereas, in 1914 the United States exports of flour were equal to only 11 per cent of the quantity milled. Canada exports a bigger proportion of the flour it manufactures than does any other country.

With the duties on wheat and flour between the United States and Canada abolished, is it probable there would, under normal conditions, be any increase in flour production on this continent? Can North America expect to control a bigger percentage of the export trade than at present? If no more flour was produced, would Canadian wheat be likely to form a bigger proportion than at present of the raw material used by North American mills? Would United States mills partially substitute Canadian wheat for United States wheat, thus releasing more United States wheat for export as wheat in competition with Canadian export wheat? Would Canadian mills be able to hold the proportion they now have of the total milled in both countries and to continue the rate of increase shown for many years? And, finally, would the changed conditions affect the price which the Canadian wheat producer could get for his product? It is in the answering of such questions as these that a correct understanding of the facts and tendencies of the international flour market is necessary.

WHEAT PRICES IN THE UNITED STATES.

Wheat grown in the United States was exported in every week of the ten crop years under review, and as a general statement it may therefore be said that some United States wheat is always on an export basis and subject to the conditions affecting price which have been considered in a previous chapter. There are, however, different varieties and qualities of wheat grown in the United States and each has its own price, varying from time to time in its relative position to the prices of other varieties and qualities. One variety of wheat of high quality is known as Northern Spring wheat. This wheat is grown principally in the states of Minnesota and North and South Dakota. Produced under similar conditions of soil and climate, rather perhaps than because the varieties of wheat are exactly the same, this wheat has qualities similar to those of Northern Manitoba wheat grown in the prairie provinces of Canada. With restrictions on trade removed, it is with Northern Spring wheat that Northern Manitoba wheat would be directly competitive, and it is with the price of Northern Spring wheat at Minneapolis and Duluth that comparison is made with the prices of Northern Manitoba on the Winnipeg Grain Exchange.

United States Northern Spring wheat is deliverable on Liverpool contracts. It is probable that United States No. 1 Northern may at times, if not always, command a slight premium over the contract grade prices at Liverpool when so delivered. With this understanding it will be interesting to compare the prices at Liverpool of contract grade wheat with the prices at Duluth of United States No. 1 Northern. The Duluth market is chosen because Duluth is the chief primary market for the Northern Spring wheat not milled in the Western States and because wheat at that point is relatively in the same position as Canadian wheat at Fort William-Port Arthur. An examination will later be made between the prices at these corresponding points.

In the markets of the United States east of the Rocky mountains the leading varieties of wheat quoted are Northern Spring, Red Winter, and Hard Winter. Other varieties are also quoted but the above three are the market leaders and in certain principal markets they constitute the contract grades of wheat. The standard grades quoted are No. 1 Northern, No. 2 Red Winter, and No. 2 Hard Winter. In the statistical report of the New York Produce Exchange the daily prices of these three grades "afloat New York" are published side by side for many years. Only in the last three or four years have the prices of the three at Chicago been similarly published by the Chicago Board of Trade. The New York market is not a primary market but its prices are based upon the current prices at the chief primary markets, plus the cost of transportation to New York. The New York prices, therefore, may be taken as correctly representing the relative value of these three wheats in the United States at any time.

In diagram 12 there is presented:—

(1) The quantities of Northern Spring wheat grown in the United States in relation to the total wheat crop of that country.

(2) Comparison between Duluth prices for No. 1 Northern and Liverpool contract grade prices.

(3) The relative values "afloat New York" of No. 1 Northern, No. 2 Red Winter, and No. 2 Hard Winter.

In fig. 1 the combined wheat crops of Minnesota and North and South Dakota are taken as indicating the amount of Northern Spring wheat grown in the United States. Certain other varieties of wheat are grown in these states, and perhaps some wheat grown outside their borders may be graded as Northern Spring wheat, but in the absence of statistics on this point the above method of arriving at an approximate measure of the quantity of Northern Spring wheat produced may be accepted as accurate enough for the purpose. The quantities of Northern Spring wheat thus estimated are indicated in fig. 1 in solid black, the balance of the wheat crop of the United States in each crop year being represented in hatching.

In fig. 2 are represented for ten years the monthly high and low prices of contract grade wheat at Liverpool, in black, and of No. 1 Northern at Duluth in red. In each case these monthly high and low prices are averaged for each crop year, the average price being represented by solid black and solid red lines. These average lines will enable a comparison to be readily made of the relative prices by crop years, and the high and low monthly prices will show relative variations within the crop years.

In examining the relationship between the prices as shown in this figure there are two general conditions to be noted. The first is the condition when the price of Northern wheat at Duluth is so much lower than the price of contract grade wheat at Liverpool that the cost of shipping from Duluth to Liverpool could be covered; that is, the condition in which Duluth wheat is on an export basis, or approximately on that basis. The second condition is when the spread between the prices is such that export business is not possible. That is to say, the first general classification of Duluth prices is into prices on an export basis and prices not on an export basis. To determine, at any time, exactly what spread is required to permit of export would

involve a checking up of the various freight rates and other charges in effect at that particular time. There will be no attempt to do this, but looking at the diagram, it is apparent that in the crop years of 1905-6 and 1912-13 Duluth was approximately at least on an export basis. In the crop year that immediately succeeded each of the two years just mentioned, while the average price for the year was apparently not sufficiently lower than the Liverpool price to be considered to be upon an export basis, an examination of the monthly high and low prices shows that for perhaps half the year in each case, during heaviest marketings, the spread was about as great as in the preceding crop year. So that for about one year and a half, beginning with September 1905 and for about the same period beginning September 1912, Duluth prices were upon an export basis. Again, in the first months of the crop year 1909-10 prices were almost, if not quite, at a point to permit of export, although on the average for that crop year prices were considerably above the export basis. During all the rest of the ten years Duluth prices were above an export basis. This is not to say that an occasional trade might not have been worked to advantage, but it is doubtful if for any continuous period as long as one month, business could have been done between Duluth and Liverpool.

Looking now at the quantity of Northern Spring wheat grown, as indicated by the solid black portion of fig. 1, it will be seen that there was a comparatively small crop in 1904, followed by a comparatively large crop in 1905 and that smaller crops grown in the next three years, followed by a large crop in 1909 and this followed by two small crops, and then the very large crop in 1912. The outline of this part of fig. 1 shows three outstanding crops, 1905, 1909, and 1912. We have seen that the crops of 1905 and 1912 were accompanied by prices substantially upon an export basis, as were also the early marketings of the crop of 1909. Periods when Duluth was substantially upon an export basis correspond with the periods when crops above the average had been produced.

If United States' millers desire to retain in the United States all the good milling grades of northern wheat that may at any time be offered for sale, all that is necessary is that they bid a slightly higher price than Europe is prepared to offer and they can in that way prevent export. So far as European competition is concerned, a small fractional advance in price would be sufficient to retain this wheat in the United States; that is, Northern Spring wheat might remain nearly upon an export basis and yet not be exported. If, however, this wheat was in strong demand among the millers of the United States, either for manufacture into straight Spring wheat flour or for blending purposes, and if at any time the quantity of good milling quality was relatively small, competition among the United States' millers might force the price upward to what was relatively a very high figure. Looking at the diagram it is seen that in the first crop year, 1904-5, the average price of Northern wheat at Duluth was not only too high to make export possible, but that on the average for the whole year it was actually some eleven cents per bushel higher than was the price of contract grade wheat delivered at dockside Liverpool. The United States' millers in that year must have competed among themselves so actively as to force the price of No. 1 Northern wheat perhaps somewhere about twenty-five cents a bushel above the export basis. This was the year in which black rust, which was prevalent also in 1916, committed such great damage to the spring wheat crop. Not only was the yield greatly reduced, but there was comparatively little wheat of the better grades and the competition of millers for the wheat of good quality became very keen. In this year there was apparently too little Spring wheat of good quality for the needs of the United States' millers.

In the next year, 1905-6, the crop was some bushels greater and did not suffer the same damage. In this year there was apparently ample wheat of this kind for local demand and prices declined substantially to an export basis. The crop of 1906-7 was some 16,500,000 bushels smaller, but, perhaps with the aid of reserves from the pre-

vious year, this quantity was evidently sufficient to keep prices almost at an export basis for a good part of the crop year. Early in the summer of 1907 the prospects for the crop of the next crop year became unfavourable. As early as June the condition reported by the Government was below the average and continuous deterioration took place. An effect on price at once occurred and during the next two years a big premium over the export price was paid by United States' millers, although in the second of these two years, which had the somewhat bigger crop, the premium was not so great as in the first year.

In September, 1909, the spread between Duluth and Liverpool was about eleven cents and a considerable spread continued for the next three or four months, but after the turn of the year rapidly narrowed until in May, 1910, the price at Duluth became higher than at Liverpool and this condition continued even beyond the close of the crop year. In April, May, and June a very decided break had occurred in prices at Liverpool, due to conditions in which the situation in North America had no part. By the end of June the condition of the growing spring wheat crop showed signs of extraordinary deterioration, and whereas the condition in June had been estimated by the Government at 92·8 per cent, the condition in July was given at only 61·6 per cent, and in August at only 61· per cent. This prospect of a poor crop for the coming crop year affected prices to a marked degree and on the average the Duluth prices remained higher than prices at Liverpool until the end of the crop year of 1910-11. The crop of 1911-12 was even smaller than that of 1910-11 and Duluth remained above an export basis, although United States' millers did not pay quite so high a premium relatively as in the previous year.

In 1912 there was harvested the greatest crop of Northern Spring wheat United States had ever known up to that time and Duluth dropped to an export basis. Ocean freight rates were higher in that year than in the previous years and this would largely account for a spread averaging about twenty cents per bushel The crop year 1913-14 witnessed declining ocean freight rates up to the month of June, and it is probable that Duluth remained upon an export basis during all this time. The bumper crop of 1912, followed by the substantial crop of 1913, apparently furnished ample supplies for the United States millers without forcing prices beyond the competitive basis established by Liverpool. In July, 1914, it is probable there was heavy buying on European account, which suggested that some interests feared war and were anxious for supplies without regard to disparity of prices, and in August the war had already begun. The last two months of this crop year were, therefore, subject to unusual conditions.

In four years during this period the crop of Northern Spring wheat was less than 160,000,000 bushels per year, as follows:—

1904015	153,793,233	bushels.
1907-07	155,210,000	"
1910-11	149,220,000	"
1911-12	131,935,000	"

With a crop below 160,000,000 bushels, contract grade Northern Spring wheat Duluth was continuously above the export basis and at times commanded a very high premium, depending no doubt on the proportion of each crop which was of good milling quality. It would seem, therefore, that a crop below 160,000,000 bushels does not provide sufficient good milling wheat of this quality for the normal demand of the United States millers.

In three years the crop was between 160,000,000 and 180,000,000 bushels per year as follows:—

1906-7	175,652,991	bushels.
1908-9	174,847,000	"
1913-14	179,160,000	"

In two of these years, 1906-7 and 1913-14, the crops had followed still bigger crops and in these two cases prices were approximately upon an export basis, for about one

half the year in the former case and probably for almost the whole of the year in the second case. The crop of 1908-9 followed a small crop and perhaps remained above an export basis, although the premium was not so great as was the case with the smaller crops. This suggests that a crop between 170,000,000 and 180,000,000 bushels provided almost enough good milling wheat of that quality for the needs of the United States millers.

In three years the crop was larger than 180,000,000 bushels, as follows:

1905-6	192,190,759 bushels.
1909-10	232,430,000 "
1912-13	263,043,000 "

In two of these years, 1905-6 and 1912-13, the price held throughout the year substantially upon an export basis, and in 1909-10 under the exceptional conditions, already pointed out, the price was for some months approximately upon the same basis. It would appear, therefore, that a supply of this kind of wheat exceeding 180,000,000 bushels per year, yielded more milling wheat of this quality than United States millers needed, or at least were prepared to take at a premium over the world's competitive basis.

Perhaps the condition may be stated in this way. A crop of 155,000,000 bushels was too small for local needs; a crop of 175,000,000 bushels was almost enough; while a crop of 200,000,000 was ample and under certain conditions too large for local use. It was a matter only of 25,000,000 to 50,000,000 bushels between the crop that was too small and the one that was too large. It is probable that the addition of 50,000,000 bushels to even the smallest crop grown in the ten years would have put prices upon an export basis.

The smallest Canadian crop of Northern Manitoba wheat in the ten years was in 1904-5, when the yield was 56,037,995 bushels. A crop of 100,000,000 bushels was exceeded in 1906-7 and in every year after, and including 1908-9. In 1913-14 the crop exceeded 200,000,000 bushels and in 1915-16 amounted to 342,948,000 bushels. Even the smallest crop, that of 1904-5, kept Canadian prices on an export basis. With the exception of three or four occasions when only insignificant quantities were upon the market or when a small squeeze was being worked on the shorts in some month toward the end of the crop year, Canadian prices were always on an export basis. Apparently in every year except 1904-5 Canada could have loaned the United States enough wheat to put the latter market on an export basis, leaving enough in Canada to keep the home market on that basis. If the United States had grown no Northern wheat at all in 1915-16 Canada could have loaned the United States enough wheat of that quality to put the United States market upon an export basis and have left in Canada a bigger supply than this country ever produced previous to 1909-10.

Fig. 3 of this diagram is now well worthy of examination in relation to the quantities of Northern Spring wheat shown in fig. 1. In this figure the three leading varieties of wheat, Northern Spring, Red Winter and Hard Winter, are represented according to relative price at New York. When, for example, the top line is red, Northern Spring wheat was at that time higher in price than either of the other two varieties, and the variety next in price is indicated by the colour of the middle line, while the variety lowest in price appears as the bottom line. No account is taken of the extent of the spread between these different varieties, but only of their comparative value in the market. Northern Spring wheat is not always the highest priced wheat in the United States and it is sometimes the lowest of the three. With a moderate or small crop, Northern Spring wheat maintained first place, but the large crops of 1905, 1909, and 1912 drove it to the middle or lowest position, and the bigger the crop the more marked the effect. The very high prices of wheat at the close of the crop year 1908-9 marked the culmination of eighteen months of rising prices due to two small world's crops in successive years (see diagram 5 and pp. 20 and 21).

and the Patten "corner" on the Chicago market was an important influence in the last few months. This artificial factor disturbed the normal relationship between the different varieties of contract grade wheat and will account for the course of the red line in April, May, and June of 1909. Except at this period Northern Spring wheat dropped from first place only when the supply was more than sufficient for the necessities of the Spring wheat millers of the United States as indicated by the fact that its price went to an export basis. The quantity of Spring wheat that will put the price on an export basis may also put it to a discount as compared with the other leading varieties of milling wheat in the United States market, according to the relative quantities of these other varieties available. This is another interesting manifestation of the relationship between quantity and price. The bearing of these facts upon the question of the price of Northern Manitoba wheat under free trade is obvious. Because Northern Spring wheat, in the United States, has at many times in the past stood at a premium which the Canadian wheat of corresponding quality did not enjoy, it by no means follows that Canadian wheat will be able to share this premium in a free market, for the simple reason that the Canadian surplus will undoubtedly be sufficient to keep both markets normally on an export basis and create the condition of supply in which Red Winter or Hard Winter may more frequently command a premium.

RELATIVE PRICES AT DULUTH AND WINNIPEG.

Duluth wheat prices in relation to contract grade prices at Liverpool have been considered on pp. 56 to 65 and the relationship is illustrated in diagram 12. The fact that Duluth prices have frequently been so high relatively to those at Liverpool that export business could not be done was there made clear. On the other hand references have frequently been made in this and in the previous report to the affect that Winnipeg prices have nearly always been, as they must necessarily be, on an export basis. In the Interim Report of 1916 the relationship between Winnipeg and Liverpool prices was discussed and illustrated in diagramatic form. It was there seen that except occasionally toward the end of a crop year when quantities available in Canada were very small and the technical position of the wheat market may have favoured the sellers, Winnipeg prices were continuously upon an export basis.

In diagram 13 Winnipeg and Duluth daily cash prices are represented for the period September, 1915, to December, 1916, inclusive. In fig. 1 of this diagram the total crop of the United States is shown with the quantity of Northern Spring wheat in each crop in solid black.

Examining the black (Duluth) and red (Winnipeg) price lines, in fig. 2, it is seen that in December, 1909, they started on a practical parity but that prices increased at Duluth faster than at Winnipeg until an average spread of about ten cents per bushel existed and this spread continued with a temporary exception in June, 1911, until the month of July, 1912. For more than two years and a half Duluth was practically continuously higher than Winnipeg on the average about ten cents per bushel. From July, 1912, until December, 1916, the prices remained on a practical parity, Winnipeg being higher than Duluth on many occasions, while only in July and August, 1915, was Duluth essentially higher than Winnipeg at any time. The period covered by this diagram can therefore be divided into two parts, the first when Duluth was higher than Winnipeg, and the second when the prices were substantially the same.

If now diagram 12 and pp. 58, 61 and 62 be referred to it will be noted that at the beginning of the crop year 1909-10 Duluth prices dropped temporarily to the export basis but that they rapidly rose above that basis and remained continuously too high for export business until September, 1912, when they again dropped to an export basis where they remained for the balance of the period shown on that diagram. When Duluth was on an export basis in this period it was on the same basis as Winni-

peg and when it was above the export basis it was above Winnipeg. A study of the daily prices in both markets for several years previous to September, 1909, shows that the same conditions prevailed.

It will be noted that it is in the months of June and July, when stocks in Canada are low and the "shorts" may have difficulty in covering, that Winnipeg tends to be highest relatively to Duluth; although in July and August, 1915, the United States Northern Spring markets were more affected by these conditions than was Winnipeg. It will be noted on the other hand that Winnipeg tends to be lowest relatively to Duluth in the months of October, November, and December. This is due to the excessive marketings in Canada in those months, which tend to drive the price even below the export basis, as pointed out in the Interim Report, p. 57. Such local conditions of relative supply may thus cause minor, or temporary variations, but the fundamental cause of a different level of prices in the two countries on the same general quality of wheat has been the existence or non-existence in the United States of a total supply adequate for the necessities of its own milling trade. Whenever the Northern Spring wheat millers of the United States have not been forced to outbid the exporter in order to satisfy their own requirements, prices in the United States have been on the same general level as those in Canada.

MINNEAPOLIS, DULUTH, AND CHICAGO MARKETS.

If Canadian wheat moved to the United States in greatly increased quantities, to what markets in the United States would it probably go? This is a very important question as affecting Canadian transportation routes. If the movement was large to the primary markets in the Northwestern States, the diversion from Canadian routes would be the most serious. The general character and the scope of the markets at Minneapolis, Duluth, and Chicago should, therefore, be understood.

In diagram 14 the receipts and shipments of wheat at these three markets are presented monthly for the crop years 1909-10 to 1915-16. In the case of Minneapolis the shipments of flour are shown as well as those of wheat, and in red outline, drawn to the same scale, the receipts of wheat at Fort William-Port Arthur are indicated for comparison with the quantities handled at Minneapolis; and the eye can easily make the comparison also with the receipts at Duluth and Chicago. So far as actual wheat is concerned, the Winnipeg market, which deals in wheat in store Fort William-Port Arthur, is an incomparably greater market than any in the United States.

In volume, Minneapolis is the most important wheat market in the United States. The following are the receipts at the principal western markets in the United States for the years 1909-14:—

Year.	Minneapolis.	Duluth.	Chicago.	Kansas City.	St. Louis.	Omaha.	Milwaukee.
	(bushels.)	(bushels.)	(bushels.)	(bushels.)	(bushels.)	(bushels.)	(bushels.)
1909	81,111,410	56,084,971	26,985,112	35,354,000	21,432,317	9,979,200	8,871,026
1910	99,721,600	34,278,377	27,540,100	43,527,700	19,702,989	9,124,800	11,439,161
1911	97,143,920	34,909,543	37,118,100	27,701,600	17,076,505	12,124,800	8,662,700
1912	*113,811,650	b86,777,990	35,914,000	43,719,600	30,541,673	16,868,800	9,697,490
1913	†111,267,560	c81,168,109	50,372,000	33,870,000	31,258,000	20,313,600	7,372,650
1914	a115,389,900	63,508,030	99,290,000	70,757,550	33,569,047	18,925,260	9,830,750
1915	142,669,370	95,122,447	70,704,000	58,693,950	35,250,404	16,587,600	6,723,175
1916	130,404,830	50,691,105	74,944,000	77,785,650	40,578,583	36,831,240	8,705,256
1917	101,021,250	30,576,769	31,751,000	36,954,900		13,714,600	7,676,447

NOTES—

*Includes 176,370 bushels Canadian wheat.
†Includes 77,920 bushels Canadian wheat.
a Includes 277,200 bushels Canadian wheat.
b Includes 15,882,290 bushels Bonded receipts.
c Includes 8,464,495 bushels Bonded receipts.

Statistics from Annual Report of the Chamber of Commerce, Minneapolis, 1914.

If the wheat shipments of Minneapolis, Duluth, and Chicago be compared upon the diagram it will be noted that Minneapolis is a market of an entirely different kind from the other two. The shipments of Chicago and Duluth appear to be equal, or nearly equal, to the receipts and to be disturbed throughout the year in almost the same way. The wheat that arrives at these two markets moves out again after, on the average, only a brief delay. They are handling markets and not consuming markets; wheat passes through them on its way to other markets.

The shipments of wheat from Minneapolis present a figure of an entirely different form. Relatively to the receipts the shipments are small, and they are fairly evenly distributed throughout the year. Minneapolis is a real consuming market for wheat; it is the greatest milling centre in America. The number and daily capacity of mills at the principal milling points in the United States was as follows, for the years 1914 and 1917:—

Cities.	Flour Mills. 1914.	Daily Barrel Capacity.	Flour Mills. 1917.	Daily Barrel Capacity.
Minneapolis	25	80,460	28	93,160
Buffalo	8	23,200	..	.....
*Kansas City	8	14,350	* 9	15,250
St. Louis	5	8,200	..	.....
Toledo	5	8,100	5	7,000
Duluth-Superior	3	6,000	3	6,000
Chicago	2	6,000	2	4,000
New York	1	11,000	1	11,000

*Includes Mill Elevators.

Statistics from Annual Reports of Chamber of Commerce, Minneapolis, 1914.

The difference between the receipts and shipments of wheat gives the measure of the consuming market at Minneapolis:—

Year.	Receipts. Bushels.	Shipments. Bushels.	Amount consumed in Minneapolis. Bushels.
1909	81,111,410	21,698,500	59,412,910
1910	99,721,600	19,207,130	80,514,470
1911	97,143,920	23,384,640	73,759,280
1912	113,635,280	29,693,910	83,941,370
1913	111,267,560	31,549,280	79,718,280
1914	115,389,900	32,953,940	82,435,960
1915	142,669,370	54,643,170	88,026,200
1916	130,404,830	40,061,860	90,342,970
1917	101,021,250	33,395,650	67,625,600

Minneapolis is therefore a consuming market for something like 80,000,000 bushels of wheat per year, but as a jobbing or handling market for wheat it is much less important than either Duluth or Chicago. It is by no means exclusively a Northern Spring wheat market, there having been inspected at Minneapolis in 1914, for example, the following kinds and quantities of wheat:—

Winter wheat. bushels.	Durum wheat. bushels.	Mixed wheat. bushels.	Western wheat. bushels.	Spring wheat. bushels.	Total. bushels.
19,595,940	4,931,970	3,865,630	222,830	90,802,430	119,410,800

Statistics from Annual Report Minneapolis Chamber of Commerce, 1914.

The wheat shipped from Minneapolis goes out over all the railway lines radiating from that point. It is a storage and jobbing market for mills in the Northwest, but is not an important factor in supplying wheat to the Eastern States or for export. The Northern Spring wheat for the eastern markets goes chiefly through Duluth. Minneapolis selects, for its own mills, 75 bushels out of every 100 bushels it receives, and sells the balance, month by month, as it is needed for consumption elsewhere. Its trade requires only about 90,000,000 bushels of Northern Spring wheat per year, but Minneapolis makes sure of at least its minimum requirements by being prepared

to outbid other markets if necessary; the surplus of the Northern Spring wheat crop goes chiefly through Duluth.

More Northern Spring wheat is grown in the Northwestern States than Minneapolis can mill and distribute, and Minneapolis apparently mills more flour, mainly out of Northern Spring wheat, than it can sell in the United States. The following are the figures for output and exports for the years 1909-17:—

Calender year.	Output Barrels.	Exports Barrels.
1909	14,867,245	1,645,970
1910	15,375,760	1,323,650
1911	15,795,470	1,136,685
1912	17,031,935	1,132,640
1913	17,673,725	1,764,805
1914	17,769,280	1,873,930
1915	18,089,195	1,459,690
1916	18,541,650	1,410,970
1917	17,610,845	1,085,590

Chicago has not developed into an important primary market for Northern Spring wheat, as is indicated on the diagram, and there is no reason to suppose that the removal of the duty on Canadian wheat would materially alter the conditions so far as Chicago is concerned. The size of the Minneapolis market is limited and except when the quality of the Northern Spring wheat crop falls far below the average, there is in the domestic crop of the Northern States more wheat of a kind and quality fairly comparable to Northern Manitoba than the mills of those States have so far been able to use. The shipments from Duluth, which are almost entirely Northern Spring wheat, are an indication of the surplus available for the eastern mills in the United States or, at times, for export.

DEVELOPMENTS SINCE THE FREE WHEAT ORDER IN COUNCIL.

On April 16, 1917, His Excellency the Governor General in Council, under the authority of the War Measures Act, 1914, ordered that wheat, wheat flour, and semolina be transferred to the list of goods which may be imported into Canada free of duty of customs. Free trade in these products between Canada and the United States was thus established, since by item 644 of the customs tariff of the United States it was provided that wheat, wheat flour, semolina, and other wheat products should be entered free of duty from countries which do not impose a duty on wheat or wheat flour or semolina imported from the United States. Although free trade was thus legally established there has not, since that time, owing to abnormal conditions in the wheat markets and later to certain agreements and understandings, been unrestricted trade between the two countries and effects cannot be clearly traced.

During the winter of 1916-17 the trading system, which had gradually developed at the principal wheat markets in North America and which was well adapted to the conditions of normal years, was subjected to a strain it was not designed to meet when the purchasing agents of the Allies in Europe, with unlimited financial resources and unlimited needs, made purchases of a large part of all the wheat offering either on the spot or for future delivery. The selling upon the future markets consisted chiefly of ordinary hedging operations, and as an unusual proportion of the crop in both countries was below contract grade in quality the sellers were not in a position to make delivery on the contracts into which they entered, but must rely upon making purchases in the future markets to clear their hedges when they were able to realize upon the lower grade wheats they held. Ordinarily no very great difficulty exists under such conditions and under the rules and practices of the grain exchanges there is no other method of protecting purchases of lower grade wheats. The agents for the Allies, which stood in need of all the wheat they could buy and desired actual delivery of the wheat, had, however, taken up so large a proportion of all the offerings on the future markets

that it became difficult and finally impossible to close out the hedging operations by making purchases of futures, because there were no sellers in the markets. A gigantic corner had been created. Prices began to rise by leaps and bounds.

On April 28 the Winnipeg Grain Exchange forbade all speculative trading in futures and appointed a board of censors to whom all transactions must be submitted. It was announced at the same time that the agents of the Allies had made no purchases of Winnipeg wheat futures during the last forty cents advance in price and that they had sufficient wheat for their present requirements. It was officially stated also that the Canadian mills appeared to be the only other important holders of futures and that they had assured the council of the exchange that their holdings were not in excess of their needs. The corner was, however, so complete that it became necessary to withdraw the facilities for trading in May and July wheat, which action was taken after the close of business on May 3. Negotiations for a settlement between the principal "longs," the agents for the Allies and the Canadian mills, and the "shorts," were at once undertaken and an agreement was reached on May 8. By one clause in this agreement the grain collecting agencies in Western Canada undertook to deliver to the buying agency for the Allies and to the Canadian mills ninety per cent of all the wheat they then controlled or might subsequently control for the balance of the crop year. It was not in the interests of the Allied Governments to allow the holdings of wheat in Canada to become scattered and the above agreement tended almost completely to nullify the provisions of the free wheat Order in Council. The clause in the agreement was as follows:—

> "We, the undersigned, this fifth day of May, nineteen hundred and seventeen, in order to conserve the food supplies of the empire and to assure the allied governments that for the balance of this crop the wheat over which we exercise control will not be diverted to other channels than those controlled by the allied governments do hereby agree in consideration of the buying agency of the allied governments giving us its assurance that it will take all grades of wheat in exchange for the Winnipeg May and July futures at spreads to be subsequently fixed, which spreads will be satisfactory and equitable to all interests, to deliver through said buying agency and to the Canadian mills in proportion to the allotment to them by agreement at least ninety per cent (90%) of the grain owned or controlled by us, and that we will further exercise our influence to direct the farmers' wheat which we may handle through our warehouses into the hands of those representing the allied governments or the Canadian mills as agreed upon."

The withdrawal of the facilities for trading in May and July futures and other changes in trading conditions necessitated the devising of new methods for carrying on business. It is not necessary to treat this aspect of the matter in detail. The council of the Winnipeg Grain Exchange worked out a practicable system, but it soon became clear that powers possessed only by the government would have to be exercised to deal effectively with the situation as a whole and particularly to establish the conditions under which the new crop would be marketed. On representations by the grain interests to this effect the government appointed by Order in Council dated June 11, 1917, the Board of Grain Supervisors of Canada. The preamble to this Order in Council states that the action was taken because "by reason of war conditions, it is considered necessary to provide means whereby the grain of Canada in excess of domestic requirements may be made available for purchase by or on behalf of His Majesty's Government of the United Kingdom and of the Allied Powers, and that the distribution of domestic requirements be controlled in such manner and under such conditions as will prevent to the utmost possible extent any undue inflation or depreciation of values by speculation, by hoarding of grain supplies, or by any other means."

The first order of the new Board, passed on July 20, fixed the maximum price of wheat, basis No. 1 Northern in store Fort William, at $2.40 per bushel, effective the

1st of August, 1917; and the second order, passed on July 27, prohibited, so far as the balance of that year's crop was concerned and until further notice, the sale and shipment of Canadian wheat to parties in the United States without the consent of the Board, declaring that "it will be held to be a violation of the orders of the Board if any party or parties export Canadian wheat of the present crop to the United States, without having requested and received the consent of the Board of Grain Supervisors for Canada thereto."

The United States had been facing conditions similar to those in Canada and the leading grain exchanges had taken action along somewhat similar lines to those worked out by the Winnipeg Grain Exchange. In the Food Control Act approved September 10, 1917, important powers were created and under these powers the Food Administration Grain Corporation was created and was established as the only buyer of wheat at the great terminal markets, and the only distributor and seller of wheat from those markets to the United States mills, to the European Allies, and to neutral countries. A commission was appointed by the President to fix the price of wheat for the crop year 1917-18 and the United States Congress established a minimum price of $2 per bushel for the wheat of the crop of 1918 and provided that the President may impose a duty upon foreign wheat coming into the United States while a minimum price is guaranteed.

Conferences were held between the Board of Grain Supervisors and the United States Grain Corporation and upon strong representations by the latter the board fixed prices for Canadian wheat for the crop of 1917-18 to correspond with the prices fixed for the United States; and an understanding was reached upon many matters of detail, including methods of dealing with the trade in wheat and flour between the two countries In a report by the board dated September 12, 1917, the following statements are made with regard to the exchange of wheat and flour between the two countries:—

> The Board of Grain Supervisors are in harmony with the United States Grain Corporation in believing that the first call upon the surplus of wheat in Canada is from the European Allies, and, prices being fixed as they are, producers in Canada have nothing to lose by such regulation of exports to the United States as will result in very little wheat being shipped to the United States for consumption there. The understanding between the board and the United States Grain Corporation is as follows: It may be advisable to permit a certain amount of Canadian wheat to be shipped to the United States in the common cause, but for all such shipments Mr. Barnes will take the responsibility. He must approve, he must purchase the wheat and distribute it, and the Board of Grain Supervisors, at his request, will permit the wheat to be exported; in a word, wheat shipments across the line either way must be subject to the approval and permission of the United States Grain Corporation and the Board of Grain Supervisors for Canada . . . .
>
> The Board of Grain Supervisors consider that the policy of the United States Food Controller in regard to flour should be adopted by the Food Controller in Canada, and also that shipments of flour from Canada into the United States and from the United States into Canada should be subject to the approval and permission of the Canadian Food Controller and the United States Food Controller.

In accordance with the above understanding with regard to exports of wheat, the United States Grain Corporation requested and received the consent of the board to the export of a few hundred thousand bushels in the month of September, which wheat was purchased and distributed by the Grain Corporation. In October, when credits were arranged at Washington by the Allied governments to assist in financing purchases of Canadian breadstuffs for shipment to Europe, certain further understandings were reached which affected trade between Canada and the United States.

The United States Food Administration entered into an agreement with the Wheat Export Company, the purchasing agent for the Allies, to secure from it certain quantities of Canadian wheat under conditions as to the delivery to the Wheat Export Company of corresponding quantities of flour; and with regard to Canadian flour the United States Food Administration laid down a condition that no exports to the United States should be permitted by the Canadian authorities. To control exports and imports of all kinds the United States and Canada established a system of licenses and the policy of the United States during recent months has been to grant no licenses for the export to Canada of either wheat or flour and Canada during the same period has granted no licenses for export of flour to the United States and the Board of Grain Supervisors has given permits for the export of wheat to any country only to the Wheat Export Company.

The custom laws of both countries provide for free trade between them in wheat and flour, but the administrative regulations it has been found wise in the common interest to adopt for the crop year 1917-18, permit no direct trade at all. For the crop year 1918-19, and as long thereafter as the United States may guarantee to its producers a minimum price for wheat, the laws of the United States empower the President to impose a duty for the protection of this minimum price. The problem of the trading policy between Canada and the United States in connection with wheat and flour must still therefore engage attention.

APPENDIX.

WHEAT.

TABLE No. 1.—Principal Wheat-producing Countries in order of Total Production for 10 years, 1904-5 to 1913-14.

	Bushels.	Per cent.
United States	6,766,623,970	20·10
Russia (including Siberia)	6,611,272,000	19·63
India	3,253,672,000	9·67
France	3,247,168,000	9·64
Bosnia and Herzegovina, Austria-Hungary, Croatia and Salvonia	2,276,800,000	6·76
Italy	1,704,640,000	5·06
Argentine	1,544,696,000	4·58
Canada	1,481,937,000	4·40
Germany	1,434,256,000	4·26
Balkan States	1,385,208,000	4·12
Spain	1,176,496,000	3·48
Australasia	823,632,000	2·47
United Kingdom	568,040,000	1·69
Algeria and Tunis, (Nor. Africa)	395,440,000	1·17
Japan	211,680,000	·63
Chili	158,896,000	·47
Belgium	139,320,000	·41
Mexico	91,088,000	·27
Uruguay	77,344,000	·23
Sweden	68,256,000	·20
Portugal	59,600,000	·18
Holland	47,704,000	·14
Greece	44,160,000	·13
Denmark	40,968,000	·12
Switzerland	36,464,000	·11
Cyprus and Malta	25,192,000	·07
Norway	2,864,000	·01
Total	33,671,416,970	100·00

Reference—United States and Canada, Government figures; Other Countries, Broomhall's Corn Trade Year Book.

Table No. 2.—The Principal Countries Wheat Crop

British Cereal year,

(,000 omitted except

	1913-14	1912-13.	1911-12.	1910-11
France	322,400	333,600	320,000	251,168
Russia (including Siberia)	880,000	728,136	508,000	832,072
Hungary	152,960	173,360	176,800	169,600
Austria	66,400	66,640	56,000	57,680
Croatia and Slavonia	16,880	11,280	14,800	13,200
Bosnia and Herzogovina	2,560	2,960	2,400	2,400
Italy	208,000	165,600	192,000	153,600
Germany	168,000	160,240	140,000	141,920
Spain	110,400	112,000	149,456	136,000
Portugal	5,600	5,600	9,600	9,200
Balkan States	131,024	145,152	173,600	177,008
Greece	4,000	7,360	3,200	2,400
United Kingdom	56,000	57,400	63,896	58,232
Belgium	14,400	15,280	14,400	12,000
Holland	4,400	4,600	4,000	4,240
Switzerland	3,520	3,179	3,520	3,200
Sweden	7,304	7,808	8,296	7,040
Denmark	4,160	3,760	4,000	4,720
Norway	280	312	240	304
Cyprus, Malta	2,400	2,400	2,400	2,400
Total Europe	2,160,688	2,006,668	1,846,608	2,038,384
*United States	760,000	730,000	621,600	635,200
†Canada	232,000	224,000	230,400	132,000
Argentine	113,600	198,400	170,400	136,000
Uruguay	5,600	8,000	9,600	9,000
Chili	16,000	12,800	14,000	20,000
Mexico	6,400	12,800	5,600	9,200
Total N. & S. America	1,133,600	1,186,000	1,051,600	941,400
North Africa (Algeria and Tunis)	40,800	31,440	44,800	45,600
India	360,000	360,800	372,000	372,000
Japan	16,000	24,800	24,000	22,080
Total, Asia	376,000	385,600	396,000	394,080
Australasia Total	108,000	94,432	83,360	105,200.
‡*Total World's Crop*	3,819,088	3,704,140	3,422,368	3,524,664
*Canada (Government returns)	231,717,000	199,236,000	216,825,941	145,991,418
†United States (Government returns)	763,380,000	730,267,000	621,338,000	635,121,000
‡Total World's Crop using Government figures for United States and Canada	3,822,185,000	3,679,643,000	3,408,531,941	3,538,576,418

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(in bushels of 60 pounds) for 10 years, 1904-5 to 1913-14.

July 31 to August 1.

in total column).

1909–10.	1908–09.	1907–08.	1906–07.	1905–06.	1904–05.	Total.
359,200	316,800	380,800	328,000	337,600	297,600	3,247,168,000
780,800	568,000	508,800	506,400	634,400	644,668	6,611,276,800
113,360	152,000	120,000	197,600	156,800	136,800	1,549,280,000
55,200	61,600	52,000	56,000	54,400	53,600	579,520,000
12,320	12,800	8,000	10,400	12,800	12,000	124,480,000
2,640	2,960	1,600	2,400	1,600	2,000	23,520,000
191,040	146,400	172,000	168,000	161,600	146,400	1,704,640,000
138,016	138,400	127,680	144,800	136,000	139,200	1,434,256,000
144,000	115,200	96,000	129,440	88,800	95,200	1,176,496,000
7,200	1,600	4,000	8,000	4,000	4,800	59,600,000
108,848	99,976	89,600	187,200	160,800	112,000	1,385,208,800
4,800	4,000	4,800	5,600	4,000	4,000	44,160,000
63,200	53,928	56,528	60,616	60,328	37,912	568,040,000
13,224	15,200	15,856	12,960	12,400	13,660	139,320,000
5,040	4,960	5,160	4,784	4,920	5,600	47,704,000
3,560	3,488	4,000	4,000	4,000	4,000	36,467,200
6,400	6,544	6,080	6,448	5,360	4,976	66,256,000
3,912	4,152	4,200	4,000	3,928	4,136	40,968,000
304	320	280	296	320	208	2,864,000
2,800	2,720	2,504	2,496	2,392	2,600	25,192,000
2,015,944	1,711,048	1,659,888	1,839,440	1,846,448	1,741,300	18,866,416,800
736,000	664,000	632,000	736,000	688,000	496,000	6,698,800,000
166,720	112,000	92,800	112,000	107,200	68,800	1,477,920,000
131,200	160,000	192,800	156,216	135,120	150,960	1,544,696,000
9,600	9,200	7,040	4,480	7,224	7,600	77,344,000
20,000	17,384	16,568	12,120	12,080	17,944	158,896,000
9,200	9,600	9,600	9,600	9,728	9,360	91,088,000
1,072,720	972,184	950,808	1,030,416	959,352	750,664	10,048,744,000
40,640	32,800	39,360	40,800	33,600	45,600	395,440,000
356,800	283,496	228,496	317,072	319,944	283,064	3,253,672,000
23,152	22,928	22,080	19,648	17,856	19,136	211,680,000
379,952	306,424	250,576	336,720	337,800	302,200	3,465,352,000
100,400	71,360	50,208	71,696	75,320	63,656	823,632,000
3,609,656	3,093,816	2,950,840	3,319,072	3,252,520	2,[illegible]	33,599,584,800
165,787,530	128,647,876	93,104,753	125,505,491	106,096,711	69,029,266	1,481,941,986
737,189,000	664,602,000	634,087,000	735,260,970	692,979,489	552,399,517	6,766,623,976
609,912,530	3,111,065,576	2,953,231,753	3,331,838,461	3,256,395,200	2,960,048,783	33,671,429,962

TABLE No. 3. Production, Consumption and Exports of Canadian Wheat and Flour.

Year.	Production.	Domestic Wheat retained for consumption.	Exports of Wheat.		Exports of Flour of Wheat.		Total Exports of Wheat and Flour.		Percentage exported as	
									Wheat.	Flour.
	bushels.	bushels.	bushels.	Per cent. *	bushels.	Per cent. *	bushels.	Per cent. *		
1880-81			2,253,673		1,978,776		4,232,449		53·3	46·7
1881-82	32,350,269	26,391,409	3,845,035	11·8	2,113,825	6·5	5,958,860	18·3	64·5	35·5
1882-83	40,951,201	32,883,036	5,867,458	14·3	2,200,707	5·4	8,068,165	19·7	72·7	27·3
1883-84	26,326,497	24,692,721	745,526	2·83	888,250	3·4	1,633,776	6·2	45·6	54·4
1884-85	41,501,464	38,603,511	2,340,956	5·6	556,997	1·3	2,897,953	6·9	80·8	19·2
1885-86	38,744,466	33,587,852	3,419,168	8·8	1,737,446	4·5	5,156,614	13·3	67·3	33·7
1886-87	34,300,881	26,327,197	5,632,726	16·4	2,340,958	6·8	7,973,684	23·2	70·6	29·4
1887-88	39,463,623	35,724,401	2,163,764	5·5	1,575,468	4·0	3,739,222	9·5	57,9	42·1
1888-89	33,000,000	31,918,781	490,905	1·5	590,314	1·8	1,081,219	3·3	45·4	54·6
1889-90	30,871,656	29,931,437	422,274	1·4	517,945	1·7	940,219	3·1	45·0	55·0
1890-91	40,527,562	37,083,818	2,108,216	5·2	1,335,528	3·3	3,443,744	8·5	61·2	38 8
1891-92	62,635,000	52,206,364	8,714,154	14·0	1,714,482	2·7	10,428,636	16·7	83·6	16·4
1892-93	49,701,000	38,579,283	9,271,885	18·6	1,849,832	3·7	11,121,717	22·3	83·4	16·6
1893-94	42,650,000	31,450,047	9,272,208	21·8	1,928,745	1·2	11,200,953	23·0	82·8	17·2
1894-95	44,583,000	34,754,024	8,825,689	19·8	1,003,287	2·3	9,828,976	22·1	89·8	10·2
1895-96	57,460,000	46,700,236	9,919,542	17·2	840,222	1·5	10,759,764	18·7	92·2	7·8
1896-97	40,809,000	31,055,815	7,855,274	19·2	1,897,911	4·6	9,753,185	23·8	80,5	19·5
1897-98	56,102,000	31,516,422	18,963,107	33·8	5,622,471	10·0	24,585,578	43·8	77·1	22·9
1898-99	68,154,000	54,282,118	10,305,470	15·2	3,566,412	5·2	13,871,882	20·4	74·3	25·7
1899-00	59,960,000	39,658,621	16,844,650	28·1	3,456,729	5·8	20,301,379	33·9	83·0	17·0
1900-01	47,867,917	33,094,009	9,739,758	20·4	5,034,150	10·5	14,773,908	30·9	65·1	33·9
1901-02	84,814,948	53,807,502	26,117,530	30·8	4,889,916	5·8	31,007,446	36·6	84·3	15·7
1902-03	93,769,450	60,192,878	30,726,947	32·8	2,849,625	3·0	33,576,572	35·8	91·5	8·5
1903-04	78,495,202	58,118,229	16,346,793	20·8	4,030,180	5·1	20,376,973	25·9	80·2	19·8
1904-05	69,029,266	55,082,168	11,280,407	16·3	2,666,691	3·9	13,947,098	20·2	80·9	19·1
1905-06	106,096,711	65,722,023	36,027,692	34·0	4,246,996	4·0	40,274,688	38·0	89·5	10·5
1906-07	125,505,491	87,421,876	33,581,119	26·7	4,503,496	3·6	38,084,615	30·3	88·2	11·8
1907-08	93,104,753	46,334,934	39,591,383	42·4	7,178,436	7·7	46,769,819	50·1	84·7	15·3
1908-09	128,647,876	73,676,717	45,879,058	35·7	9,092,101	7·1	54,971,159	42·8	83·6	16·4
1909-10	165,787,530	98,132,072	52,298,646	31·5	15,356,812	9·3	67,655,458	40·8	77·3	22·7
1910-11	145,991,418	79,213,063	52,098,694	35·7	14,679,661	10·1	66,778,355	46·8	78,0	22·0
1911-12	216,825,941	118,666,470	78,928,747	36·4	19,230,624	8·9	98,159,471	45·3	80·4	19·6
1912-13	199,236,000	81,681,171	97,872,405	49·1	19,682,424	9·9	117,554,829	59·0	83·2	16·8
1913-14	231,717,000	99,056,160	111,662,639	48·2	20,998,201	9·1	132,660,840	57·3	84·2	15·8
1914-15	161,280,000	76,866,022	62,376,798	38·7	22,037,180	13·7	84,413,978	52·4	73·9	26 1
1915-16	376,303,000	87,166,960	253,597,502	67·3	35,538,538	9·3	289,136,040	76·5	87·5	12·5

*These percentage columns are percentages of Total Production.

*These percentage columns are percentages of Total Production.

Production.—

1900-15, From Grain Statistics.

1891-99, U. S. Department of Agriculture Year Book; 1887-90, Canada's Statistical Year Book. } From the Library of the Census and Statistics Office, Department of Trade and Commerce.

Exports.—

1880-1906, The fiscal years ending June 30th, from Canada's Statistical Year Book.

1907-1916, Crop years, ending August 31st, compiled from Trade and Navigation Reports.

TABLE No. 4.—United States Crops, Domestic Consumption, and Exports of Wheat and Flour by years, 1880 to 1915. Compiled from Agricultural Year Book, Statistical Abstract of United States, Supplement to Corn Trade News, October 12, 1915. Columns marked % are percentages of the Total Crop.

United States Fiscal or Crop Years.	Wheat Production.			Domestic retained for consumption	Exports of Domestic Wheat and Flour.		Exports of Domestic Wheat alone.		Exports of Domestic Flour.		Wheat.	Flour.
	Winter.	Spring.	Total.									
	bushels.	bushels.	bushels.	bushels.	bushels.	Per cent.	bushels.	Per cent.	bushels.	Per cent.		
1880-81			498,550,000	312,228,486	186,321,514	37·4	150,565,477	30·2	35,756,037	7·2	80·8	19·2
1881-82			383,280,000	261,387,611	121,892,389	31·8	95,271,802	24·9	26,620,587	6·9	78·2	21·8
1882-83			504,185,000	356,373,684	147,811,316	29·3	106,385,828	21·1	41,425,488	8·2	71·9	28·1
1883-84			421,086,000	309,551,818	111,534,182	26·5	70,349,012	16·7	41,185,170	9·8	63·1	36·9
1884-85			512,765,000	380,194,634	132,570,366	25·9	84,653,714	16·6	47,916,652	9·3	63·9	36·1
1885-86			357,112,000	262,546,207	94,565,793	26·5	57,759,209	16·2	36,806,584	10·3	61·0	39·0
1886-87			457,218,000	294,413,031	153,804,969	33·6	101,971,949	22·3	51,833,020	11·3	66·2	33·8
1887-88			456,329,000	336,703,656	119,625,344	26·2	65,789,261	14·4	53,836,083	11·8	55·0	45·0
1888-89			415,868,000	327,267,257	88,600,743	21·3	46,414,129	11·2	42,186,614	10·1	52·4	47·6
1889-90			490,560,000	381,129,533	109,430,467	22·3	54,387,767	11·1	55,042,700	11·2	49·7	50·3
1890-91			399,262,000	293,080,684	106,181,316	26·2	55,131,948	13·8	51,049,368	12·8	52·1	47·8
1891-92			611,780,000	386,114,188	225,665,811	36·9	157,280,351	25·7	68,385,460	11·2	69·9	30·1
1892-93			515,949,000	324,036,365	191,912,635	37·2	117,121,109	22·7	74,791,526	14·5	61·1	38·8
1893-94			396,131,725	231,848,596	164,283,129	41·5	88,415,230	22·3	75,867,899	19·2	53·9	46·1
1894-95			460,267,416	315,454,698	144,812,718	31·5	76,102,704	16·5	68,710,014	15·0	52·7	47·2
1895-96			467,102,947	340,658,979	126,443,968	27·1	60,650,080	13·0	65,793,888	14·1	48·9	51·1
1896-97			427,684,346	282,559,374	145,124,972	33·9	79,562,020	18·6	65,562,952	15·3	55·2	44·7
1897-98			530,149,168	312,843,164	217,306,005	41·0	148,231,261	28·0	69,074,744	13·0	68·5	31·5
1898-99			675,148,705	452,530,285	228,618,420	33·0	139,432,815	20·7	83,185,605	12·3	62·9	37·0
1899-00			547,303,846	361,207,084	186,096,762	34·0	101,950,389	18·6	84,146,373	15·4	54·9	45·1
1900-01	350,025,409	172,204,096	522,229,505	306,239,432	215,990,073	41·4	132,060,667	25·3	83,929,406	16·1	61·2	38·8
1901-02	429,675,000	318,785,000	748,460,218	513,687,703	234,772,516	31·4	154,856,102	20·7	79,916,414	10·7	65·9	34·0
1902-03	411,788,666	258,274,000	670,063,008	467,157,410	202,905,598	30·3	114,181,420	17·1	88,724,178	13·2	56·5	43·5
1903-04	399,867,000	237,954,000	637,821,835	517,094,222	120,727,613	18·9	44,230,169	6·9	76,497,444	12·0	36·6	63·4
1904-05	334,987,000	219,164,000	552,399,517	508,286,607	44,112,910	8·0	4,394,402	0·8	39,718,508	7·2	11·1	88·9
1905-06	428,463,000	264,517,000	692,979,489	595,370,482	97,609,007	14·1	34,973,291	5·0	62,635,716	9·1	35·8	64·1
1906-07	492,888,000	242,373,000	735,260,970	588,560,545	146,700,425	20·0	76,569,423	10·5	70,131,002	9·5	52·4	47·6
1907-08	409,442,000	221,645,000	634,087,000	471,043,331	163,043,669	25·7	100,371,057	15·8	62,672,612	9·9	61·6	38·4
1908-09	437,908,000	226,694,000	664,602,000	550,333,532	114,268,468	17·2	66,923,244	10·1	47,345,224	7·1	58·6	41·4
1909-10	446,366,000	290,823,000	737,189,000	649,824,682	87,364,318	11·8	46,679,876	6·3	40,684,442	5·5	53·5	46·5
1910-11	434,142,000	200,979,000	635,121,000	565,809,240	69,311,760	10·9	23,729,302	3·7	45,582,458	7·2	34·2	65·8
1911-12	430,656,000	190,682,000	621,338,000	541,648,596	79,689,404	12·8	30,160,212	4·8	49,529,192	8·0	37·8	62·2
1912-13	399,919,000	330,348,000	730,267,000	587,387,403	142,879,597	19·6	91,602,974	12·6	51,276,622	7·0	64·2	35·8
1913-14	523,561,000	239,819,000	763,380,000	617,789,651	145,590,349	19·1	92,393,775	12·1	53,196,575	7·0	63·4	36·6
1914-15	684,990,000	203,057,000	891,017,000	558,552,025	332,464,975	37·3	259,642,533	29·1	72,822,442	8·2	78·1	21·9
1915-16	659,000,000	345,000,000	1,011,505,000	767,882,975	243,117,025	24·3	173,274,015	17·26	69,843,010	7·0	71·3	28·7

Table No. 5.—Production and Export of Wheat.

	Argentina.		Russia		Australasia.		India.		Balkan States.		Total.	
	bushels	bushels	bushels.	bushels	bushels	bushels.	bushels.	bushels.	bushels.	bushels	bushels.	bushels.
1899-00	101,655,000	†79,408,000	o396,022,000	58,960,000	50,111,000	7,040,000						
1900-01	74,753,000	†40,216,000	o401,772,000	77,152,000	56,610,000	18,496,000						
1901-02	56,380,000	†20,144,000	o360,755,000	87,448,000	43,927,000	14,792,000						
1902-03	100,636,000	†61,440,000	o351,942,000	134,176,000	20,461,000							
1903-04	129,672,000	†81,080,000	o316,646,000	138,160,000	81,627,000	28,280,000						
1904-05	*150,960,000	103,200,000	f664,668,800	179,200,000	63,560,000	35,200,600	283,064,000	76,800,000	112,000,000	52,800,000	1,895,680,000	505,260,000
1905-06	*135,120,000	104,800,000	f634,400,000	155,200,000	75,320,000	30,400,000	319,944,000	25,600,000	160,800,000	76,800,000	2,124,650,000	530,684,000
1906-07	*156,216,000	108,800,000	f506,400,000	92,800,000	71,636,000	29,600,000	317,072,000	29,600,000	187,200,000	76,800,000	2,099,349,000	522,385,000
1907-08	*192,800,000	130,460,000	f508,800,000	60,800,000	59,208,000	17,600,000	228,496,000	21,600,000	89,600,000	23,200,000	1,797,096,000	463,414,000
1908-09	*148,000,000	109,680,000	c568,000,000	96,800,000	71,360,000	11,504,000	283,496,000	29,360,000	90,976,000	39,200,000	1,964,082,000	485,784,000
											9,880,866,000	
1909-10	*131,200,000	58,784,000	c780,800,000	222,400,000	160,400,000	46,912,000	356,800,000	32,832,000	108,848,000	39,200,000	2,381,024,000	555,147,000
1910-11	*136,000,000	92,400,000	c832,072,000	220,800,000	105,200,000	60,000,000	372,000,000	−57,600,000	177,008,000	87,200,000	2,403,392,600	651,090,000
1911-12	*170,400,000	92,800,000	c508,000,000	79,200,000	83,360,000	50,400,000	372,000,000	−56,800,000	173,600,000	76,800,000	2,115,521,000	533,848,000
1912-13	*166,400,000	120,000,000	728,136,000	105,600,000	94,432,000	49,600,000	360,800,000	−67,200,000	145,152,800	53,600,000	2,124,424,000	656,433,000
1913-14	*113,600,000	56,000,000	880,000,000	160,000,000	100,000,000	56,000,000	360,000,000	−28,000,000	131,024,000	56,000,000	2,569,721,000	634,251,000
1914-15	178,221,000	91,480,000	833,965,000	1,120,000	32,480,000	1,848,000		31,704,000		240,000		
1915-16		64,152,000		1,176,000		35,224,000		4,520,000			11,921,085,000	
	Production.	Exports.	Production.	Exports.	Production.	Exports.						

*Broomhall's Corn Trade News. Crop harvested 15 weeks subsequent to July-August.
1899-00 to 1903-04 from Year Book of Department of Agriculture, U.S.A., 1901.
†Argentina and Uruguay exports of wheat and flour.
o Russia in Europe.
f 72 Governments, including Siberia.
c 73 Governments.
1899-1900 to 1903-04 Exports crops years ending August 1st.
‡ Year Book Department of Agriculture, U.S.A., 1915.
1904-5 / 1913-14 Argentina and Australasia, year April to May.
1914-15 / 1915-16 Broomhall's Corn Trade News, Weekly, July-August. Copy August 1st, 1916.
1904-05 / 1913-14 *Russia, July, August, India, Balkan States.
1914-15 / 1915-16 Argentina and Uruguay. July-August.
−Wheat and Flour.
Balkan States, Roumania, Bulgaria and Roumania, Servia.

TABLE No. 6.—Quantities of Wheat retained at Home from following chief of Exporting Countries.

Year.	Grand Total.	United States.	Canada.	Russia.	Balkan States.	India.	Argentine.	Australia.
July-Aug.	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.	bushels.
1904-05....	1,390,420,000	508,286,607	55,082,168	485,468,000	59,200,000	206,264,000	47,760,000	28,360,000
1905-06....	1,593,975,000	595,370,482	65,722,023	479,200,000	84,000,000	294,344,000	30,320,000	44,920,000
1906-07....	1,576,964,000	588,560,545	87,421,876	403,600,000	110,000,000	287,472,000	47,416,000	42,096,000
1907-08.....	1,333,682,000	471,043,331	46,334,934	448,000,000	66,400,000	206,896,000	62,400,000	32,608,000
1908-09....	1,478,298,000	550,333,532	73,676,717	471,200,000	60,776,000	254,136,000	38,320,000	29,856,000
1909-10.....	1,825,877,000	649,824,682	98,132,072	568,400,000	69,648,000	323,968,000	72,416,000	53,488,000
1910-11.....	1,749,302,000	565,809,240	79,213,063	611,272,000	89,808,000	314,400,000	43,600,000	45,200,000
1911-12....	1,611,676,000	541,648,596	118,666,470	428,800,000	96,800,000	315,200,000	77,600,000	32,960,000
1912-13.....	1,767,991,000	587,387,403	81,681,171	622,536,000	91,552,000	293,600,000	46,400,000	44,832,000
1913-14.....	1,935,470,000	617,789,651	99,056,160	720,000,000	75,024,000	332,000,000	57,600,000	44,000,000
1914-15	.....	558,552,025	76,866,022	832,853,000			86,741,000	30,632,000
1915-16..	....	....	87,166,960	....			....	

Broomhall's Corn Trade News. Russia, Balkan States, India, Argentine, Australia.
Government Figures, Canada and United States.

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TABLE No. 7.—United Kingdom—Flour of Wheat—Imports and Exports (domestic).

Year.	Imports	Exports Home made flour.
	Bbls.	Bbls.
1884	8,625,000	137,000
1885	9,047,000	136,000
1886	8,393,000	160,000
1887	10,321,000	186,000
1888	9,663,000	216,000
1889	8,384,000	221,000
1890	9,013,000	216,000
1891	9,556,000	226,000
1892	12,632,000	244,000
1893	11,662,000	262,000
1894	10,934,000	258,000
1895	10,496,000	272,000
1896	12,183,000	400,000
1897	10,674,000	342,000
1898	12,009,000	460,000
1899	13,111,000	524,000
1900	12,313,000	640,000
1901	12,901,000	667,000
1902	11,078,000	449,000
1903	11,772,000	370,000
1904	8,413,000	404,000
1905	6,831,000	655,000
1906	8,109,000	600,000
1907	7,598,000	692,000
1908	7,411,000	988,000
1909	6,315,000	783,000
1910	5,691,000	725,000
1911	5,751,000	805,000
1912	5,882,000	940,000
1913	6,845,000	933,000
1914	5,748,000	1,095,000
	289,361,000	15,006,000

Ref.—Millers' Almanac.

TABLE No 8.—United States—Flour of Wheat.

Census Year.	Flour Produced. (Barrels).	Flour Exported. (Barrels).	Flour Retained at home. (Barrels).	Percentage of Flour. Exported.
1904	104,013,278	11,542,618	92,470,660	11·09
1909	105,756,645	9,687,993	96,068,652	9·16
1914	116,045,090	12,768,073	103,277,017	11·00

Reference.—Year Book, Dept. of Agriculture, U. S. A. and U. S. Census Bulletin, Manufactures, 1909, Statistics for the Flour Mill and Grist Mill Industry. (See file 6-8).

Canada—Flour of Wheat.

Special Census Year.	Produced.	Exported.	Retained.	Percentage Exported.
1915	14,267,424	5,568,750	8,698,674	39·03

TABLE No. 9.—Wheat and Flour of Wheat Exports from United States, fiscal years ending June 30, 1901 to 1916.

Year.	Flour (Bbls.)	Wheat (Bus.)
1901	18,650,979	132,060,667
1902	17,759,203	154,856,102
1903	19,716,484	114,181,420
1904	16,999,432	44,230,169
1905	8,826,335	4,394,402
1906	13,919,048	24,973,291
1907	15,584,667	76,569,423
1908	13,927,247	100,371,057
1909	10,521,161	66,923,244
1910	9,040,987	46,679,876
1911	10,129,435	23,729,302
1912	11,006,487	30,160,212
1913	11,349,805	91,602,374
1914	11,821,461	92,393,775
1915	16,182,765	259,642,533
1916	15,520,669	173,274,015

TABLE No. 10.—Production of Flour at the principal centres in the United States (barrels).

Year.	New York.	Toledo.	Chicago.	St. Louis.	Milwaukee.	Duluth.	Buffalo.	Kansas City.	Minneapolis.
1897	2,500,000	990,000	1,118,000	1,081,000	1,945,000	2,531,000	1,098,000	704,000	13,625,600
1898	2,500,000	1,144,000	1,037,000	1,055,000	2,027,000	2,460,000	860,000	1,102,000	14,233,000
1899	2,500,000	1,150,000	1,059,000	1,166,000	1,840,000	1,745,000	1,069,000	1,095,000	14,292,000
1900	2,225,000	1,092,000	1,275,000	1,346,000	1,867,000	345,000	831,000	1,292,000	15,083,000
1901	1,761,000	1,595,000	1,290,000	1,505,000	1,937,000	861,000	1,115,000	1,431,000	15,922,000
1902	2,500,000	1,600,000	1,262,224	1,322,530	1,755,051	1,809,620	965,662	1,298,359	16,260,105
1903	2,500,000	1,308,000	838,878	1,112,316	1,443,420	1,178,695	990,103	1,535,460	15,581,805
1904	2,035,000	875,000	600,000	1,102,980	1,320,616	835,720	2,206,000	1,595,100	13,652,735
1905	1,500,000	857,000	975,000	1,286,000	1,418,140	793,145	2,465,000	2,053,000	14,253,190
1906	2,275,000	1,102,000	960,000	1,010,000	1,259,087	908,175	2,501,678	1,989,263	14,898,348
1907	2,200,000	1,243,000	1,000,000	1,189,000	1,288,945	715,280	3,108,000	1,974,949	13,660,465
1908	2,150,000	1,084,000	850,000	966,000	1,371,721	577,577	3,003,310	2,591,765	13,694,895
1909	2,000,000	970,000	1,058,000	926,000	1,480,376	624,290	3,172,500	2,427,376	14,867,245
1910	1,250,000	1,057,240	1,090,000	969,545	1,318,565	784,790	4,095,650	2,266,266	15,680,260
1911	2,000,000	1,352,700	1,027,600	1,055,416	1,041,682	730,485	4,731,000	1,822,257	15,501,230
1912	2,300,000	1,386,200	1,108,000	1,030,704	1,020,801	996,635	4,674,089	2,080,268	17,031,935
1913	2,500,000	1,312,700	1,028,000	1,036,761	733,735	1,115,590	4,571,552	2,221,617	17,673,725
1914	2,000,000	1,491,500	1,083,000	1,579,079	727,588	1,212,625	5,454,369	2,376,840	17,769,280
1915	2,000,000	1,428,750	1,115,000	1,678,463	640,425	1,334,535	5,669,794	2,865,460	18,089,195

Compiled from St. Louis Merchant Exchange Reports. The Millers' Almanac.

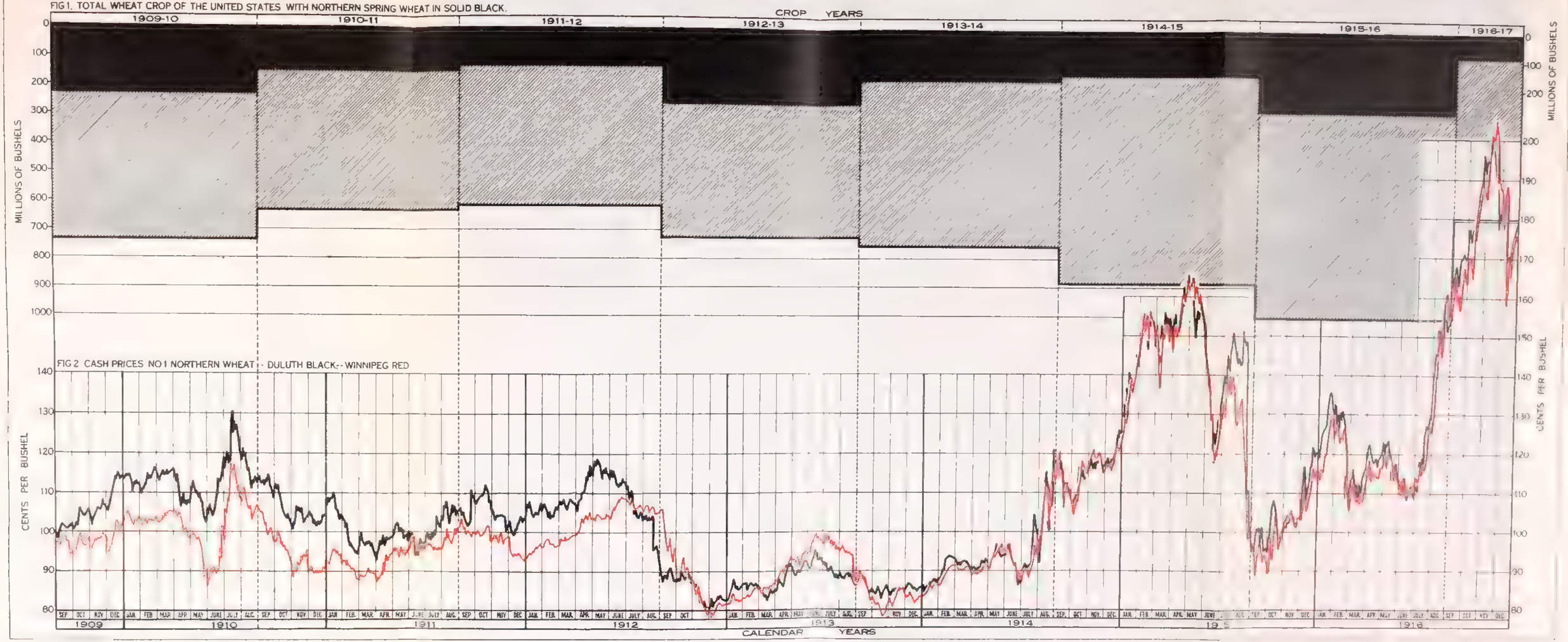
TABLE No. 11.—Minneapolis Flour Exports.

Year.	Barrels.	Year.	Barrels.
1892	3,337,205	1905	2,188,775
1893	2,877,277	1906	2,425,035
1894	2,370,736	1907	2,349,540
1895	3,080,935	1908	2,121,255
1896	3,717,265	1909	1,645,970
1897	3,912,630	1910	1,323,650
1898	3,991,395	1911	1,136,685
1899	4,009,135	1912	1,132,640
1900	4,702,485	1913	1,764,805
1901	3,879,905	1914	1,873,930
1902	3,410,405	1915	1,459,690
1903	3,081,115	1916	1,410,970
1904	1,741,120	1917	1,085,590

WHEAT PRICES AT WINNIPEG AND AT DULUTH IN RELATION TO UNITED STATES PRODUCTION.

Sept. 1915 - Decr. 1916

FIG 1. TOTAL WHEAT CROP OF THE UNITED STATES WITH NORTHERN SPRING WHEAT IN SOLID BLACK.



RECEIPTS AND SHIPMENTS OF WHEAT

BY MONTHS SEPT. 1909 TO AUG. 1916

MINNEAPOLIS

(WITH FT. WILLIAM & PORT ARTHUR IN RED OUTLINE FOR COMPARISON)

FIG.1. RECEIPTS OF WHEAT AT MINNEAPOLIS IN BLACK (WINTER WHEAT HATCHED) RECEIPTS OF WHEAT AT FT WILLIAM & PORT ARTHUR IN RED OUTLINE.

FIG.2. SHIPMENTS OF FLOUR FROM MINNEAPOLIS.

FIG.3. SHIPMENTS OF WHEAT FROM MINNEAPOLIS.

DULUTH

FIG.4. RECEIPTS OF WHEAT.

FIG.5. SHIPMENTS OF WHEAT.

CHICAGO

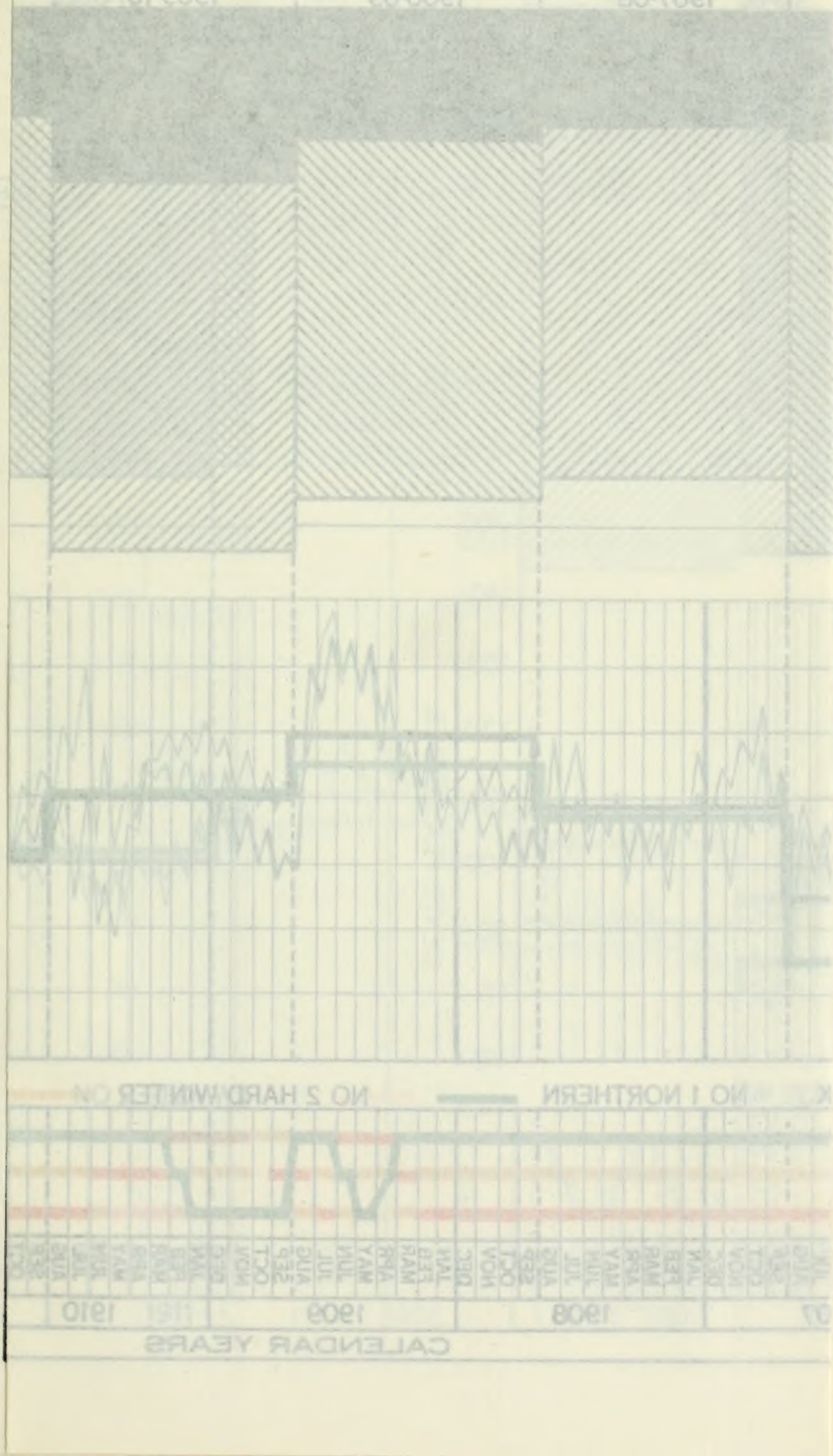
FIG.6. RECEIPTS OF WHEAT. (SPRING WHEAT HATCHED)

FIG.7. SHIPMENTS OF WHEAT.

MILLIONS OF BUSHELS

09 1910 1911 1912 1913 1914 1915 1916

1918



UNITED STATES NORTHERN SPRING WHEAT IN RELATION TO PRICES

FIG. 1. TOTAL PRODUCTION OF WHEAT IN THE UNITED STATES, WITH NORTHERN SPRING WHEAT IN SOLID BLACK.

FIG.2. HIGH & LOW MONTHLY PRICE, AND AVERAGE BY CROP YEARS, OF CONTRACT GRADE WHEAT AT LIVERPOOL (BLACK), AND NO 1 NORTHERN WHEAT AT DULUTH